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SELECTED ECONOMIC TRANSLATIONS  
ON EASTERN EUROPE

INTRODUCTION

This is a serial publication containing selected translations on all categories of economic subjects and on geography. This report contains translations on subjects listed in the table of contents below. The translations are arranged alphabetically by country.

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## POLAND

### The Polish Coke Industry--Its Achievements and Future Development

[This is a translation of an article by Aleksander Szpilewicz, in Koks-Smola-Gaz, Vol IV, Nos 5-6, September-December 1959, Katowice, pages 205-211; CSO: 3656-N]

The day of 13 December 1959 was characteristic of the development of the Polish coke industry. On that day the 100 millionth ton of coke produced since the industry was taken over by Polish authorities in the spring of 1945 left the inside of the chamber. Exactly on the same day the 25 millionth ton of coke left the country as a strong expression of Poland's participation in the work for the economic development of the people's democracies. Fourteen and one-half years--almost half the life of one generation--was needed to reach this target. It will probably be necessary to wait only seven years for a new "centennial."

Table 1 gives an idea of the nature of the quantitative and qualitative changes which took place in the coke industry within the framework of our present borders over the 20 years of 1938-1958.

Table 1

Indicators	1938	1958
1. Processing of coal, million tons	7.840	13.155
From Upper Silesia	5.932	11.030
From Lower Silesia	1.908	2.135
2. Number of coal-supplying mines	23	31
In Upper Silesia	17	25
In Lower Silesia	4	6
3. Input of coal according to type and origin, million tons		
Imported coal	-	0.656
Domestic coal: Type 35/37	1.820	1.817
Type 34	2.044	4.816

[table continued]

Indicators	1938	1958
Type 33	3.976	5.723
Type 32 and declassified	-	0.153
4. Number of coke plants equipped with modern coal works with possibility of proper milling and dosages of several component mixtures	4	11
5. Total coke production, million tons	5.933	10.165
Coke plants of Upper Silensia-Krakow district	4.565	8.534
Lower Silesian coke plants	1.368	1.634
Foundry coke plants	1.011	3.450
Mine coke plants	4.922	6.715
6. Production of metallurgical coke, million tons	2.362	6.650
With resistance M-40=70	0.767	1.940
M-40=60 to 69	0.522	2.818
M-40=50 to 59	0.400	1.892
M-40=40 to 49	0.653	-
7. Number of installed coking chambers	2,214	2,682
In foundry coke plants	357	804
In mine coke plants	1,857	1,878
8. Total annual coke production per chamber, tons	2,680	3,790
9. Production of coal derivatives, 1,000 tons	234.1	436.2
Raw tar	83.5	141.4
Raw benzol	64.0	110.4
Ammonia sulphite		
10. Supply of coke gas to long-distance network, excluding internal turnover between coke plant and mine and coke plant and "own" foundry, million normal cubic meters	150**	1,403.1
From coke plants of the Upper Silesian district	-	1,120.5
From coke plants of the Lower Silesian district	150**	282.6
11. Tonnage of coal supplies to coke plants, million tons by the mine's own means of transport (belts, cable railway, narrow track)	6.609	3.371
By PKP*	1.231	9.794
Deliveries of Lower Silesian coal to the Upper Silesian-Krakow district	-	0.940
Deliveries of Upper Silesian coal to the Lower Silesian district	-	0.884

[table continued]



Indicators	1938	1958
12. Net tonnage of coke supplied to iron foundries for big furnaces	1.350**	3.956**
Purposes outside the present borders (export)	0.600**	2.065**

\*PKP = Polskie Koleje Panstwowe, Polish State Railroad  
 \*\*Approximately

To produce 100 million tons of coke in the postwar period the coking plants used 129.810 million tons of input coal. At the same time, gas works produced 9.445 million tons of post-gas coke, consuming a further 12.290 million tons of fused coal, and smoldering plants gave 2.103 million tons of semi-coke, processing 2.7 million tons of non-fused pit coal. Thus, the total quantity of coal subject to processes of degassing in high and low temperatures amounted since the end of the war to 144.8 million tons--that is, 12.4 per-cent of that extracted. Of course, at present this per-centage is higher--amounting to 15.9 in 1959.

Table 2 provides information on the qualitative struc-ture and origin of input used in coking plants.

Table 2

Indicators	1945-25 Nov 1959		1958	
	Million Tons	Per-cent	Million Tons	Per-cent
Imported coal	1.775	1.4	0.656	5.0
Coal type 35 (Upper Silesian, Gliwice mine)	7.397	17.0	0.650	13.7
36/37 (Lower Silesian)	14.772		1.157	
34 (Upper Silesian)	38.233	39.8	3.848	36.6
34 (Lower Silesian)	13.561		0.968	
33 (Upper Silesian)	53.353	41.8	5.723	44.7
32 (Upper Silesian)	0.719		0.153	
Total input	129.810	100.0	13.155	100.0

[table continued]

Indicators	1945-25 Nov1959		1958	
	Million Tons	Per-cent	Million Tons	Per-cent
Out of this the mines supplied:				
By their own means of transport	57.603	44.3	3.371	23.6
Via standard gauge railroad	72.207	55.7	9.794	74.4
Coal carried from Lower Silesian mines to coke plants of the Upper Silesian-Krakov district	8.457	6.5	0.940	7.1
Including: Type 35/37	8.088		0.940	
Type 34	0.379		-	
Coal carried from Upper Silesian mines to Lower Silesian coke plants	6.107	4.7	0.884	6.7
Including: Type 34	3.265		0.297	
Type 33	2.842		0.587	
Out of the total input, the coke plants were supplied:				
From Upper Silesian mines	99.702	75.8	10.374	78.8
From Lower Silesian mines	28.333	21.8	2.135	16.2
From import	1.775	1.4	0.656	5.0

There is a systematic drop in the participation of Lower Silesian coals in quantitative (and also qualitative) respects as a factor that stabilizes the coke-creating properties of input mixtures. Also, the extraction of coals of higher types reached, in a certain number of Upper Silesian mines, a level close to optimum and has recently shown no major changes. This is illustrated in Table 3.

Table 3

Deliveries of Input Coal	1955 (1,000 tons)	1958
Gliwice Mine	674.7	549.9
B. Chrobry Mine	585.0	406.6
Victoria Mine	528.3	498.3
Mieszko Mine	96.5	262.4
Total type 35/37	1,885.5	1,817.2
Concordia Mine	153.9	225.6
Zabrze-Zachod Mine	447.5	297.9
Anna Mine	1,194.1	1,340.0

[table continued]

<u>Deliveries of Input Coal</u>	<u>1955</u>	<u>1958</u>
Marcel Mine	1,039.1	1,201.0
Debiensko Mine	714.8	783.5
Thores Mine	999.8	712.5
Slupiec Mine	73.8	203.3
Nowa Ruda Mine	121.0	52.2
Total type 34	4,754.5	4,816.1

The technical and organizational effort made in the past period to balance the structure of consumption with the structure of supply of input coals gave important results--namely:

1. At the cost of about 400 million zlotys, the potential of the departments for preparation of input was created or recreated, including reconstruction of railroad sidings. This is expressed in 54 hammer mills, 51 disintegrators, 359 dosage containers with a total capacity of about 80,000 tons, and buffer storage places outside the coke plant area with a capacity of about 120,000 tons.

2. In cooperation with the suppliers, the problem of receiving and crushing large-chunk coal classes (plus 80 millimeters) for input purposes was solved, without permitting any leaks of higher type coals for power purposes.

3. Brought under control, although not without side effects, was the problem of utilization of powder and clays of higher type coals in the form of a flotation concentrate, averaged with the remaining granular classes. The suppliers still have to regulate the problem of thermal drying of these components of input.

4. Great elasticity was obtained in adapting coking plants to changes in coal supply and to working on multi-component mixtures, at the same time narrowing down the tolerances of the main properties of the input mixture and freeing deficit coals (type 34-35/37) solely for the production of metallurgical coke.

These are indubitable achievements, although attained at the price of considerable investment outlays for the coal preparation projects, and of shaping transport connections in a way completely different from before the war. Practice has confirmed the far-sightedness and effectiveness of the executed program of complete reconstruction of the

inherited primitive installations for the preparation of the input. There can be no doubt that the national economy was saved many millions in investments with a long period of freezing of resources for the construction of new mines for coking coal, in comparison to the alternative situation--that of tolerating provisional solutions. We will return to this problem when considering the question of quality and consumption of coke.

In order for the hundred millionth ton of coke to be included in the stream of the national production of fuels, it was necessary to effect a proper increase in the potential of the coking plants, and particularly to increase the number of furnace batteries. First it was necessary to absorb the difficult problems of designing, execution of materials and installations, and construction and setting fire under the new coke batteries, which was particularly difficult since it was done for this first time with our own resources and, except for the coke plant at the Lenin foundry, under conditions of work of the "old" plants and the well known lack of space.

Not counting the reconstruction of three disassembled coking plants (Zaborze, Jadwiga, Zdzieszowice) and seven batteries reconstructed within the framework of capital repairs from the foundation plate or from the vault of regenerators, in the postwar period 18 new batteries were completed with a total productive capacity of 4.4 million tons of coke per year. Table 4 presents the location and the start of production of the new batteries.

Table 4

Coke Plant	Year of Starting Operations	Battery System	No. of Blocks	No. of Chambers
The Upper Silesian-Krakow District:				
Walenty	1949	Otto	1	55
Makoszowy	1951	Otto	2	56
Gliwice	1951/52	Otto	2	70
Kosciuszko	1952/54	Koppers	2	120
Jadwiga	1954	Otto	1	28
Debiensko	1955	Otto	2	56
Lenin Foundry	1954/58	Giprokoks	6	342

[table continued]

Lower Silesian district:

Victoria

1955/59

Otto

2

70

Total

18

897

The construction of four additional batteries with 228 chambers is considerably advanced, of which two are batteries of the Lenin foundry and two are batteries constituting the first stage of the coking plant in the Bierut foundry in Czestochowa.

In the program of modernization and expansion of the "furnace" chain with the necessary machines there is an investment of about 150,000 tons of fireproof materials and about 40,000 tons of equipment, machines, and steel constructions. Expressed in monetary terms, this amounts to about one billion zlotys, constituting the total of expended of individual years, without coefficients concerning changes in prices of labor and materials. As a result of the execution of this program, the following totals of coke were produced in the reporting period (in million tons):

From old batteries, including the production of three rebuilt coking plants	77.778.
From new batteries of postwar construction	22.222.

At present the share of coke production from new batteries reached 45.5 percent of the total production.

In the implementation of the program of construction of furnace batteries, two typical stages can be differentiated:

1. The Six-Year Plan, 1950-1955, in which the dynamics of increase in coke production was determined by the program of expansion of coking plants at the mines, initiated earlier. The new batteries in foundry coking plants, started later, gave only 2.399 million tons of coke,

2. The Five-Year Plan, 1956-1960, in which the dynamics of increase in coke production was determined by new batteries in foundry coking plants. As a result of this, until the "jubilee," days the outcome of the "competition" was even, in the form of 11.152 million tons of coke from the new batteries at the mines and 11.056 million tons from the new foundry batteries.

Such an approach in the investment policy resulted from important economic and organizational-manpower considerations, namely:

a) Possibilities for rapid satisfaction of the needs of the devastated country for coke products and a determination to put coke on the foreign market at the time of good prospects, at the cost of comparatively modest investment outlays and on the basis of the utilization of the remainder of the technological chains of coking plants at the mines.

b) Possibilities for accumulation of considerable material resources and experienced cadres in the period of organization of a modern fuel base for modernizing metallurgy, with a sufficiently "long breath" for the cycle of designing and developing the construction sites.

The correctness of the principle, implemented in the past, of parallel development of the "metallurgical" and "non-metallurgical" coke sector is clearly evident from the fact that throughout the whole past period there was no need for a drastic reduction of the demand of the basic users of coke-chemical products on the domestic market. Also, a considerable percentage of that production, in accordance with the accepted obligations for several years, was directed to the foreign markets.

In the total of 100 million tons of coke there were 62.176 million tons of metallurgical coke, which gives an average of 62.2 percent. The division of metallurgical coke according to qualities is presented in Table 5. The data in Table 6 give the basic directions of coke consumption.

Table 5

Coke	1945-25 Nov1959		1958
	Million Tons	Per-cent	Percent
Quality I: M-40=70	13.639	21.9	29.1
Quality II: M-40=50 to 59	26.269	42.2	42.3
Quality III: M-40=50-59	18.350	29.5	28.4
Quality IV: M-40=40 to 49	3.918	6.4	-
Total metallurgical coke (big furnace and cast)	62.176	100.0	100.0

Table 6

Consumption	1945-25	Nov 1959	1958
	Million Tons	Per-cent	Percent
For melting pig iron	36.935	36.9	39.0
For the production of fusions (spieki)	1.878	1.9	3.7
For the production of casts	2.377	2.4	2.7
In nonferrous metallurgy	2.472	2.5	2.3
Total metallurgy and machine industry	43.662	43.7	47.7
For the production of ammonia	2.717	2.7	4.5
For the production of carbide	1.833	1.8	1.8
For the production of soda	0.606	0.6	0.7
Total chemical synthesis	5.156	5.1	7.0
Other industrial purposes	12.806	12.8	16.8
Heating purposes	12.376	12.4	8.5
Total domestic consumption	74.000	74.0	79.8
Export	26.000	26.0	20.2
Total	100.000	100.0	100.0

It follows from Table 6 that there is a systematic increase in coke consumption for industrial purposes with a drop in the quantity of coke used for heating purposes and for export. This phenomenon in itself would not be disquieting if the increase in the share of the coke mass consumed in domestic industry--so typical of an industrializing country--did not lead to cuts in the quantities directed to the heating market and to foreign markets. The symptoms of this phenomenon appear for the near future, and threaten to upset the equilibrium under conditions where:

a) the results of absence of prosperity in coal could be eased by a rather strong position of Polish coke on foreign markets, and for a long period of time;

b) the export of Polish coke influences the shaping of the commercial exchange with members of the Council of Economic Mutual Aid (Rada Wspolpracy Gospodarczej), and particularly the import of metallurgical raw materials (ores), which we do not possess;

c) the substitution of coke and gas for coal in households constitutes an economic, technical, and social regression and there are still not sufficient foundations to



ensure rapid replacement of coke by a different fuel (oils, natural gas).

The source of the evil stems from a too slow rate of increase of coke production in 1955-1960 with relation to the increase in demand. The slowing down of the rate of development of coke plants is mostly a result of the slowing down of the development of extraction of coke and gas-coke coals, with a simultaneous increase in quantitative requirements made by iron foundries and importers as concerns metallurgical coke. For this reason, at the threshold of the new stage we are facing an apparently paradoxical dilemma: whether to continue to maintain the high quality of coke for the domestic iron foundries, which--with the limited domestic resources of higher types of coals and the limited possibilities of importing them--will influence the quantity of coke produced and therefore adversely affect the remaining sectors of the economy, or to "dilute" the input mixtures with further quantities of gas coals with weaker coking properties--that is, to decide on a mechanically weaker coke for its main users while increasing the total coke production and therefore the production of strong gases and coal derivatives. The dilemma is difficult and--like every difficult thing--not very popular.

The very method of confronting the problem of quantity with that of quality may give rise, as counter-arguments, to the following demand:

a) for a radical improvement of the technology of classical coke production, facilitating considerable dynamics of increase in the quantity of coke while retaining or even improving its quality, on the same quantitative and qualitative base of domestic coals of higher types--that is, with a further impoverishment of mixtures;

b) a more rapid passage to coke formed from nonfused coals in such large quantities that they should determine the future rate of increase of the coke mass;

c) a radical increase in the extraction of deficit coals from new ROW [not identified] mines;

d) a considerable increase in imports of coal for coke, because in any case the revenues from coke export exceed by several times the expenditures for coal import--looking from a narrow branch point of view.



At the same time we realize that none of the postulates dealt with here can be implemented in a short period of time or to an extent that will restore completely the balance between the rate of development of the coke industry and the rate of development of the sections of the national economy consuming coke and gas. An analysis of the past period should aid in finding an answer to this dilemma.

Simultaneously with the production of the 100 millionth ton of coke, the Polish foundries produced 32.63 million tons of accounting pig iron and the foundries of the countries of the people's democracy melted on Polish coke about 15 million tons of pig iron more. Table 7 illustrates in an outline the big furnace coke management in iron foundries.

Table 7

Indicators	1945-25 Nov 1959		1958	
	Million Tons	Per-cent	Million Tons	Per-cent
Production of accounting pig iron	32.630		3.864	
Receipt of large furnace coke by iron foundries	38.140		4.157	
Elimination in large furnaces	1.205	3.4	0.201	5.5
Used in large furnaces	36.935	100.0	3.956	100.0
From foundry coke plants	20.780	56.4	2.853	72.0
From coke plants at the mines	16.155	43.6	1.103	28.0
Unit consumption of coke, kilograms per ton of accounting pig iron	1,130		1,022	
Unit consumption of pulverized coke (koksik) for fusions (spiek) in kilograms per ton of accounting pig iron	58		97	

Table 8 gives indices of input coal consumption per ton of large furnace coke in the group of coking plants which served mostly iron foundries and in the group of coking plants which served mostly export for metallurgical purposes.

Table 8

Indicators	1945-25	
	Nov 1959	1958
	(Million Tons)	
1. Coking plants producing large furnace coke mostly for iron foundries:		
Input coal	63.353	7.090
Type 35/37 including imported coal	12.902	1.802
Type 34	29.341	3.125
Type 33	21.110	2.163
Production of large furnace coke	38.144	4.426
Unit consumption of coal, kilograms per ton of large furnace coke		
Type 35/37	338	407
Type 34	770	705
Type 33	552	490
Total	1.660	1.603
From production of large furnace coke at the furnaces received	38.140	4.157
Surplus passed to other users		
Unit consumption of coke corresponding to the production of one ton of accounting pig iron, kilograms per ton of coal:	0.004	0.269
Type 35/37 including imported coal	394	360
Type 34	900	808
Type 33	646	560
Total	1.940	1.834
2. Coking plants producing large furnace coke mostly for export (excluding ZK [not identified] Victoria:		
Input coal	32.800	2.950
Type 35/37 including imported coal	7.342	0.454
Type 34	18.845	1.251
Type 33	6.613	1.233
Production of large furnace coke	19.402	1.770
Unit consumption of coal, kilograms per ton of large furnace coke:		
Type 35/37 including imported coal	378	263
Type 34	970	705
Type 33	342	695
Total	1.690	1.663
3. ZK Victoria, producing mostly casting coke:		
Input coal	7.408	0.660
Type 35/37	3.700	0.205

[table continued]

Indicators	1945-25	
	Nov 1959	1958
Type 34	3.608	0.440
Type 33	0.100	0.015
Production of casting coke with large furnace coke	4.530	0.445
Unit consumption of coal, kilograms per ton of metallurgical coke:		
Type 35/37	800	463
Type 34	780	990
Type 33	22	35
Total	1.602	1.488

It follows from Table 8 that the unit consumption of coke for the production of one ton of accounting pig iron, despite the general drop of 106 kilograms--that is about 5.5 percent in 1958 as compared with the average for the past period--shows in the items of coals of higher types a statistical drop of only 20 kilograms (from 1,294 to 1,274 kilograms)--that is, 1.5 percent. In addition, it follows that the share of coals of higher types increases in the input of coking plants cooperating with foundries, with relation to their total quantity in the input of all the coking plants:

Share in Input, Percent	1945 to 25	
	November 1959	1958
Type 35/37 coal including imported	48.5	65.0
Type 34 coal	56.5	65.0

At the same time we observe a considerable drop in the consumption of deficit coals for the production of one ton of large furnace coke destined for export purposes: from 1348 to 968 kilograms--that is, by 28.2 percent. There is also a drop in their consumption in the ZK Victoria serving the machine industry: from 1,580 to 1,453 kilograms--that is, by 8 percent. The available space does not make it possible to supplement the quantitative indices with an analysis of the qualitative changes in the properties of processed coals and produced coke. The year 1959 did not bring an improvement in the ratio of the coal input to the accounting pig iron as compared with 1958, despite a drop in the unit consumption of coke net per ton of pig iron from 1,022 to about 990 kilograms per ton. The shortening of the cycle of coking in the coking plant of the Lenin foundry

resulted in disadvantageous effects in the form of decrease in large-size coke output and decreased the amount of coke directed to large furnaces.

Table 9

Products	1945-25 Million Tons	November 1959 Kilograms per Ton of Coal	1958 Kilograms Per Ton of Coal
Raw tar	4.121	32.80	33.10
Raw benzol	1.343	10.35	10.75
s/ammonia [sodium?]	1.058	8.15	8.40
	Million Nm <sup>3</sup> *	Nm <sup>3</sup> * per Ton of coal	Nm <sup>3</sup> * per Ton of coal
Gas for long-distance network (excluding internal turn- over coke plant-furnace:	12.385	96	107
For the ZGO** Zabrze network	8.986		
For the ZGO Walbrzych network	3.399		

\*Normal cubic meter

\*\*Zakłady Gazownictwa Okregu, Gas Workds of the District

The one hundred million tons of coke were of course accompanied by the production of liquid and gaseous coking products (See Table 9). Coke gas retained the most important position in the balance of the domestic consumption of high-calorie gases, after excluding the consumption of the coke plant. The net supply in 1958 was:

	Million Nm <sup>3</sup>	Percent
Coke gas	2,223.2	57
Natural gas	1,093.6	28 (converted in-
Municipal gas	598.4	15 to coke gas)

A considerable increase in the effectiveness of coke gas consumption was ensured. The indices of consumption of coke gas in 1958, with a gross production of 4.1 billion normal cubic meters (taken as 100) are as follows (in percent):

1. Consumption by the coke plants		42.0
For heating batteries	39.5	
Boilers and other purposes	2.5	
2. Supply of gas to consumers		57.5
Iron foundries	39.0	
Chemical synthesis	1.0	
Other industrial users	10.0	
Households	7.5	
3. Loss of gas in conductors		0.5
Total	100.0	

Nevertheless, the effects of consumption for heating batteries continue to be disadvantageous. The part of heat covered by large furnace gas does not correspond to the part played by foundry coking plants in the total coke production. In 1958 only 10.2 percent of the production of large furnace gas was used in heating batteries (see Table 10).

Table 10

Type of Fuel	Kilocalories	Percent
Heat in coke gas	$6.75 \times 10^{12}$	79.5
Heat in big furnace gas	$1.50 \times 10^{12}$	17.5
Heat in post-synthesis gas	$0.25 \times 10^{12}$	3.0
Total annual heat consumption	$8.50 \times 10^{12}$	100.0
Unit heat consumption per kilogram of coal	647	

This state of affairs prevents a wider utilization of coke gas as a chemical raw material and in households. With an average index of household gas consumption per head of population at 25.3 normal cubic meters per year (1958), despite the strong position of coking, we fall considerably behind such countries as France and West Germany, where the consumption is twice as high.

Liquid products of de-gasing covered in most of the domestic demand for products of bulk type and for pure products from tar and benzol. The position of these products on foreign markets was also perpetuated.

The sections of tar and benzol processing were in practice built from the foundations because from one enterprise--the "Hajduki," active in 1945-- we obtained ten tar distilleries and four benzol distilleries.

The main composition of coal derivatives as of 1958 is illustrated in Table 11.

Table 11

Composition	Thousand Tons	Percent
Tar products		
1. Bulk products, pack type	385.8	75.6
2. Bulk products, oil type	100.7	19.8
3. Naphthalenes	20.1	3.9
4. Phenols, creosols	4.1	
5. Anthracites, 50 and 90 percent	0.1	0.9
6. Organic bases	0.2	
Total tar products	512.0	100.0
Total pure and purified products	24.5	4.8
Benzol products		
1. Bulk products	84.7	59.5
2. Pure aromatic compounds	36.2	29.7
Benzene	20.3	15.7
Toluene	15.3	12.6
Xylene	0.6	0.4
3. Cumarone resins	0.8	0.8
Total benzol products	121.7	100.0
Total pure products	37.0	30.4

So far, about 500 million zlotys have been invested in the development of tar and benzol distilleries. The action of purifying phenol waste in the coke industry is expanding. The annual recovery of raw phenols from water, converted into a product of 100 percent concentration, has already reached about 1,000 tons.

Summing up, from the accounting and statistical point of view, this rich stage of postwar development of the Polish coke industry, it is possible to conclude that the country owes much to this industry.

## POLAND

### Maritime Services in the Balance of Payments

[This is a translation of an article by Magister Jerzy Wesolowski of Warsaw, in Technika i Gospodarka Morska, Vol IV, No 12, December 1959, Gdynia, pages 373-376; CSO: 3618-N/1]

The method of presenting economic relations with abroad in force in Poland is based on a system of four balances. They treat, in value terms, assets and liabilities, effective payments, and indebtedness at the end and the beginning of the reporting period.

The balances must show the turnover in the basic fields of economic activity. Such a field, apart from commodity turnover, is the maritime services, which are itemized in the balances as follows:

- 1) Value of freight and insurance contained in the invoice with CIF export and CIF import;
- 2) shipment services--sea shipments and freights--covered by the account of the forwarder;
- 3) maritime services--including directly settled services rendered by ships and to ships, and to a certain extent also loading in ports.

#### Maritime Services

This last item in the balances prepared by the NBP [Narodowy Bank Polski; Polish National Bank], Foreign Department (Dep. Zagraniczny), is prepared on the basis of statistics of bank payments and of reports of enterprises participating in foreign trade. The general turnover in maritime services in the 1956-1958<sup>1</sup> balances are presented in Table 1.

Table 1

Maritime Services in Foreign Turnover 1956-1958  
(in 1,000 foreign currency zlotys)

Year	State at Beginning of Year		Adjust-ments		Revenues		Adjust-ments		Settlements*		State at End of Year	
	Debit	Credit	Assets	Liabilities	Debit	Credit	Debit	Credit	Debit	Credit	Debit	Credit
1956	10,736	659	124,945	-	92,237	-	30,405	13,083	713			
1957	13,672	714	118,084	-	85,237	-	36,706	9,585	939			
1958	9,636	930	129,468	11,173	89,193	17,096	29,528	14,611	1,081			
				(Liabilities)		(Payments)						
1956	3,325	7,619	144,922	-	115,290	-	34,148	4,951	4,729			
1957	4,740	6,541	197,693	-	162,607	-	30,113	2,291	9,067			
1958	2,230	6,156	181,033	10,739	145,935	13,433	32,334	4,232	11,228			

\*Settlements in compensation



It should be noted that the basic principle in the preparation of Table 1 is its balancing. This means that, for example, the assets for the beginning of the year plus the assets created during the year and the adjustments, less revenues and adjustments, less settlements in compensation, should equal the balance of the state at the end of the year.

The state of the assets and liabilities at the beginning and end of the year are elements of balance of international indebtedness. In 1958 the state of the assets (debit minus credit) at the end of the year clearly increased, reaching the figure of 13,530,000 zlotys, while liabilities amounted to only 5,995,000 zlotys. Thus, in the field of maritime services, our economy, through the respective enterprises, financed abroad to a greater extent than it itself took advantage of foreign credits! The increase in credits granted in current accounts was 4,824,000 zlotys (balance of assets for the beginning of the year less balance at the end of the year), while the credits received on the side of liabilities increased by only 70,000 zlotys, which is treated in the balance of property and credit operations. Excluded from these comparisons are state credits received by us, which concern freight connected with the shipment of goods received within the framework of the American loan.

As concerns the effective revenues and payments, which are elements of the balance of payments, they are based on the data of banking statistics, in many cases differing from materials sent by enterprises. In connection with this, to preserve the principle of balancing this table, all differences are included in the adjustments, which also cover the items of assets and liabilities settled abroad by some enterprises in place of other domestic enterprises.

For an analysis of the role of maritime services in foreign turnover, of essential importance is a comparison of the balance of payments and accounting balance in these services, which are as follows (in 1,000 zlotys):

Year	Balance of Payments	Accounting Balance
1956	-23,053	-19,977
1957	-76,917	-79,509
1958	-50,742	-51,565

This table shows clearly, particularly in the example of 1958, the relative usefulness of the balance of payments for an analysis of the role of services in international exchange; although this balance depicts the effective burden of foreign currency payments on the national economy, it does not define the value of services which were utilized in the given year.

In connection with the fact that materials for the preparation of the accounting balance are supplied by enterprises according to fixed patterns, it is possible to introduce a comparatively detailed commodity division of the turnover. The balance of payments does not give these possibilities, as it registers payments which are usually a result of settlement of accounts.

#### Port Services

Both assets and liabilities are divided into two basic groups---port services and transport services---which contain more detailed titles.

Table 2

Assets (Revenues) for "Port Services" (in 1,000 foreign currency zlotys)

Type of Service	1956	1957	1958
Total	44,504	40,003	47,700
Port charges	9,221	7,710	10,267
Fuel (bunker): a) solid	8,681	6,496	3,031
b) liquid	2,254	1,122	1,317
Supplies: a) ships	5,172	5,422	5,694
b) sailors	-	-	4,435
Reloading and storage	7,660	6,555	11,360
Provisions	4,990	4,856	2,888
Repairs	607	986	748
Advance payments to captains	3,569	3,129	3,169
Other port services	2,050	3,727	4,791

Table 2 shows that in 1958 port charges played the main part in assets (22 percent of the total assets), followed by reloading and storage (24 percent), with comparatively insignificant charges for solid fuel (bunker) (6 percent), while in 1956 solid fuel still constituted 18 percent of the assets. It must be stressed that the fluctuations in the total assets are considerable and result partly from an increase in services rendered to foreign countries, and partly from a change in the methodology of showing turnover --namely, in 1958 the assets of the "Baltona" for cashing of sailors' coupons were included for the first time in the balance as corresponding to liabilities because of foreign exchange remuneration of our sailors. Before then the item of services showed only the liabilities of domestic shippers resulting from foreign exchange supplements, without containing the sums which, through the coupons sold to sailors for foreign currency, returned to the domestic enterprise, in effect decreasing the expenditures of our economy by the foreign currency supplements.

Thus, in order to present port services rendered exclusively to foreign ships, it is necessary to deduct the value of the coupons from the total sum. After this correction, the assets, according to geographical division, are presented in Table 3.

Table 3

Assets from "Port Services" According to Countries (in 1,000 foreign currency zlotys)

Country	1956	1957	1958
Total	44,505	40,003	43,265
Finland	10,797	9,821	6,136
USSR	7,886	6,028	4,706
West Germany	6,090	5,100	5,401
Great Britain	4,115	4,034	5,883
Sweden	3,305	3,358	3,832
Norway	2,048	1,354	2,103
Denmark	2,116	2,010	2,511
France	1,918	2,289	1,694
United States	712	1,755	2,694

In the course of the years given, the very considerable drop in assets from Finland is noteworthy. It is connected

with the drop in proceeds for deliveries of fuel coal, occurring in the previous table, which drop almost solely concerns Finland.

Changes in assets for port services of course result to a large extent from changes in ship movements in Polish ports. For this reason it will be interesting to present on the one hand the capacity of entering ships (empty and with cargo) according to the most important flags, and on the other hand the assets per NRT [presumably, net register ton] (Table 4).

Table 4

Foreign Tonnage Entering Polish Ports and Revenues Ob-  
tained from it per NRT

Flag	1956		1957		1958	
	1,000 Zlotys per NRT <sup>1</sup>	Zlotys per NRT	1,000 Zlotys per NRT <sup>2</sup>	Zlotys per NRT	1,000 Zlotys Per NRT <sup>3</sup>	Zlotys Per NRT
Total	5,516	8.06	5,093	7.85	6,444	6.71
Finland	652	16.55	656	14.97	598	10.26
West Germany	-	-	-	-	1,156	4.67
Great Bri-						
tain	391	-	316	-	430	-
Sweden	561	5.89	558	6.01	687	5.57
Norway	509	4.02	365	3.59	413	5.09
Denmark	360	5.87	377	5.33	476	5.27
France	337	5.69	396	5.78	296	5.72
United States	101	7.00	287	6.11	434	6.20

1 Rocznik Statystyczny 1957 [Statistical Yearbook 1957]

2 TGM [Technika i Gospodarka Morska], No 3, 1958

3 TGM, No 5, 1959

The exclusion of Great Britain from the considerations was necessary because often the assets concern not only ships under British flag but also ships of other countries, the owner of which have their accounts in English banks.

Considering only a three-year period, it is difficult to speak about definite trends, and for this reason only a study of a longer period of time could give material on, for example, the needs of planning assets. The drop in the

general total of assets per NRT is mostly a result of the serious drop in services for Finland.

As concerns our liabilities (to abroad) they exceed the assets considerably so that the balance for port services was negative in the following amounts (in 1,000 foreign currency zlotys):

1956	6,045
1957	24,525
1958	23,435

In detail, the liabilities are as given in Table 5.

Table 5

Liabilities for "Port Services" to Abroad (in 1,000 foreign currency zlotys)

Type of Service	1956	1957	1958
Total	50,549	64,527	66,700
Port charges	7,908	10,951	13,328
Fuel (bunker):			
a) solid	1,560	1,505	1,105
b) liquid	9,625	13,815	12,934
Supply of ships	6,550	10,042	6,698
Reloading and storage	10,575	11,041	14,514
Provisions	3,117	4,551	6,349
Repairs	3,313	3,807	2,326
Remuneration of crews:			
a) foreign	120	112	-
b) domestic	4,510	3,811	5,137
Other port services	3,258	4,892	4,309

The main part is played by reloading and storage, constituting 22 percent of the total; port charges--20 percent, liquid fuel--19 percent. The systematic increase in liabilities results mostly from the increase in tonnage of the Polish fleet, because the burdening of one NRT with port costs dropped in the last three years:

	1956	1957	1958
Capacity in NRT on 31 December (according to TGM, Nos 2, 1957; 2, 1958; 2, 1959)	171,983	206,292	246,097
Liabilities in zlotys per NRT	293.9	312.7	271.0

As a result of switching from steam to motor ships, the liabilities for liquid fuel also changed. In 1953 these liabilities still amounted to only 4,314,000 zlotys and now amount to 12,934,000 zlotys.

Table 6

Liabilities for "Port Services" According to Countries  
(1,000 foreign currency zlotys)

Country	1956	1957	1958
Total	50,549	64,527	66,700
Great Britain	15,262	19,170	18,794
West Germany	7,716	11,771	7,468
Belgium	6,029	3,631	3,686
Egypt	2,408	2,584	6,078
Brazil	2,153	3,049	3,420
Sweden	1,959	2,214	2,263
India	1,666	1,730	685
Argentina	1,492	1,408	1,548
France	1,125	1,565	1,013
China	1,433	2,639	689
Finland	1,114	2,094	1,013
United States	-	2,654	3,291

Of interest in table 6 is the rather serious increase in liabilities to Egypt and, in comparison with 1956, the increase in liabilities to the United States, which is a result of the opening and development of shipping lines to the American ports.

### Maritime Transport Services

Our assets for transport services classified by kind are given in Table 7:

Table 7  
Assets for Maritime Transport Services (in 1,000  
foreign currency zlotys)

Type of Service	1956	1957	1958
Total	80,441	78,081	81,758
Charters on time	646	1,214	-
Line hauls	48,239	51,235	53,368
Tramp hauls	15,497	14,744	11,152
Freight provisions	1,768	3,224	3,109
Other transport services	14,291	7,664	14,139

The structure of this turn over shows a clear predominance of assets for line rather than tramp shipments. It seems that this line nature of our fleet results, among other things, in the fact that business cycle fluctuations in freight rates have a lesser influence on the earnings of our fleet. It must, however, be stressed that the volume of foreign currency earnings of our fleet is influenced not only by the situation on the freight market but mostly by the magnitude of the utilization of the fleet to ship our own cargoes. A decrease in the use of the fleet for shipping our own cargoes in CIF export and FOB import will make it possible to use it for foreign cargo. A drop in direct foreign currency proceeds for the services of our fleet may, however, be offset by an increase in assets in the "services" item in commodity invoices. This occurs, for example, when our own fleet starts to transport more cargo in CIF export.

In view of the fact that the tonnage of the Polish fleet increased by about 19 percent in 1957-1958 and at the same time the share of the fleet in carrying our own cargo dropped, the maintenance of assets on approximately the same level is a result of changes in freight charges.

Table 8  
Assets for Maritime Transport Services by Countries  
(in 1,000 foreign currency zlotys)

Country	1956	1957	1958
Total	80,441	78,081	81,758
China	16,285	9,060	7,653

[table continued]

Country	1956	1957	1958
Great Britain	11,442	10,631	6,825
Czechoslovakia	10,830	14,433	20,714
East Germany	8,073	8,405	9,531
Sweden	4,230	2,728	2,944
Belgium	3,553	3,803	1,850
Finland	3,182	6,539	2,647
West Germany	1,837	1,969	3,134
Denmark	649	506	2,335

Liabilities for transport services, as do assets, depend on the situation on the international freight market and also on conditions of deliveries of goods in our foreign trade, as well as use of our own fleet in these shipments.

Table 9

Liabilities for Maritime Transport Services  
(in 1,000 foreign currency zlotys)

Type of Service	1956	1957	1958
Total	94,373	133,166	114,333
Charters on time	15,662	23,315	4,975
Line shipments			
a) import	23,455	10,918	5,667
b) export		19,813	16,565
Tramp shipments			
a) import	54,015	60,178	57,847
b) export		11,144	27,743
Freight provisions	903	944	514
Other transport services	338	6,854	1,022

While we could convince ourselves that the Polish fleet has assets mostly for line shipments, it is mostly tramp freights, which are subject to comparatively strong business cycle changes, that figure in liabilities. This situation may bring advantages to the foreign currency management.



Table 10

Liabilities for Maritime Transport Services According to  
Countries ( in 1,000 foreign currency zlotys)

Country	1956	1957	1958
Total	94,373	133,166	114,333
Great Britain	21,768	37,950	23,306
Sweden	14,286	17,927	14,065
Norway	14,085	8,475	5,700
West Germany	9,996	17,350	12,385
Finland	8,823	11,701	4,284
Holland	5,453	3,334	4,015
Denmark	2,854	6,342	5,400
Italy	2,884	1,583	1,240
United States	1,711	14,460	27,025

The predominance of liabilities for shipment of goods over revenues of our own fleet results in the fact that a drop in freight rates on the world market is rather an advantageous phenomenon for our national economy as a whole.

As is well known, liabilities for the transport of exported goods are covered in the price of goods, in connection with which they are also shown in the balance as service items in commodity invoices on the assets side. This item covers transport services of our own and of foreign fleets, which fact hampers to a great extent an analysis and a check on the correctness of data, which in liabilities come from ship owners and in assets from foreign trade centers. According to data of ship owners, liabilities for the transport of cargoes in export amounted to about 30.9 million zlotys in 1957, and about 44.3 million zlotys in 1958, not including liabilities resulting from charters on time which also carried export goods. Meanwhile, service assets in commodity invoices in CIF export, given by foreign trade centers, reached the total of 33.3 million zlotys in 1957 and 49.6 million zlotys in 1958. It would follow from this that the participation of the Polish fleet in transport of export cargo amounted to about 2.4 million zlotys in 1957 and 5.3 million zlotys in 1958. It seems, however, that the utilization of the Polish fleet is higher in this field.

Nevertheless, it seems desirable to compare on the one hand the liabilities for shipping export cargo and on the other hand the assets for services in commodity invoices

in CIF export, because the foreign exchange arbitrage essential for the national economy is involved here.

Table 11

Liabilities for Maritime Transport Services According to Countries in Export Shipments (1,000 foreign currency zlotys)

Country	1957		1958	
	Line	Tramp	Line	Tramp
Total	19,813	11,144	16,565	27,743
Denmark	904	362	466	1,522
Holland	1,246	1,632	760	2,327
West Germany	372	5,507	717	5,123
Norway	194	641	485	1,239
Sweden	10,113	89	6,780	445
Switzerland	-	-	-	2,202
Great Britain	4,727	2,284	5,463	9,465

Table 12

Assets for Transport Services in CIF Export According to Countries (in 1,000 foreign currency zlotys)

Country	1956	1957	1958
Total	43,657	33,315	49,579
Argentinian	2,956	2,256	14,624
Great Britain	14,379	9,138	11,941
United States	5,589	4,610	4,836
Brazil	5,634	4,388	3,736
Egypt	2,179	1,181	2,042
Ireland	50	2	1,544

Although geographic division is not a suitable factor for a foreign exchange analysis, it can be stated that, taking into account only Great Britain and the United States, in 1958 the free currency assets for services in invoices amounted to a minimum of 16.8 million zlotys. Free currency liabilities constituted a minimum of 20 million zlotys. Thus, CIF export involved, to a certain extent, a disadvantageous exchange in the form of payment of free foreign exchange for sea transport and collecting clearing foreign exchange.

Liabilities for transport of imported goods are much higher than for exported goods, because in imports these obligations, constituted about 85.4 percent in 1957 and 88.5 percent in 1958 and in export<sup>2</sup> it was 15.1 percent and 25.7 percent respectively.

Table 13

Liabilities for Maritime Transport Services in Shipments of Imported Goods (in 1,000 foreign currency zlotys)

Country	1957		1958	
	Line	Tramp	Line	Tramp
Total	10,918	60,178	5,667	57,847
Finland	224	7,983	20	3,164
West Germany	2,572	7,829	1,041	5,282
Norway	1,413	2,578	400	3,428
Sweden	3,440	1,768	1,685	4,477
Great Britain	976	18,599	1,151	4,879
United States	421	9,264	445	24,804

The particularly high share of liabilities to the United States for shipments does not result from the direct use of that country's ships but from the terms of the credit agreement with the United States, which also covers the cost of shipments of goods delivered within the framework of that agreement, regardless of the rationality of the ship<sup>3</sup>.

A supplement to the above are liabilities for maritime transport--that is, resulting from covering the costs of transport by the price of the product imported on CIF terms. These liabilities, according to data of foreign trade centers, are given in Table 14:

Table 14

Liabilities for Maritime Transport Services in Shipments of CIF Import (1,000 foreign currency zlotys)

Country	1956	1957	1958
Total	(1,098)	(5,545)	17,870
Finland	(428)	(3)	2,006
Australia	(57)	(45)	8,919
United States	-	-	4,685

The low liability figures in 1956 and 1957 result from lack of proper data.

On the basis of the materials presented, it is possible to determine for 1958 the foreign currency costs of transporting imported goods. They amount to 81,384,000 zlotys. It is essential, from the point of view of an analysis of burdening the national economy with the costs of transport of imported goods, to take into account the value of services of our own fleet used in these shipments. Unfortunately, this data is not published; only the value of shipments to and from Polish ports, including transit, is given. Thus, it is not possible to compare the value of these goods or to calculate the costs of transport per ton of cargo in import. Neither can similar considerations be applied to export. However, this data would greatly facilitate long-range foreign currency planning.

Table 15

Summary Computation of the Balance of Maritime  
Services (1,000 foreign currency zlotys)

Item	A s s e t s			Liabilities		
	1956	1957	1958	1956	1957	1958
Maritime services	124,945	118,084	129,467	144,922	197,693	181,033
Transport services in commodity invoices with CIF import and export	43,657	33,315	49,579	1,095	5,545	17,870
Value of purchase of shiphandler products in the "goods" item	--	--	--	9,421	11,668	9,328
Value of deliveries in sailors export	2,581	2,678	--	--	--	--

[table continued]

Item	1956	1957	1958	1956	1957	1958
Maritime services in the item of cargo forwarding services	23,000	22,000	16,117	5,000	4,500	2,269
Total	194,183	176,077	195,164	160,441	219,406	210,500
Balance	+ 33,742	--	--	--	-43,329	-15,336

The table cannot be considered a balance of maritime economy because it fails to include several items, such as import of ships and liabilities for liquid fuel which we import for the domestic refuelling stations. In addition, the table does not take into account the already mentioned services of our own fleet in import, since they have no direct foreign currency significance. However, the table gives a general picture of the influence of maritime services on the accounting balance. The balance of these services was adverse. A change in this state of affairs can be made only by developing our own fleet.

#### Footnotes

<sup>1</sup>Turnover for maritime services for, 1952-1955 was discussed in my article entitled: "Maritime Services in the Accounting Balance and Balance of Payments," Handel Zagraniczny, No 5, 1957, p 20.

<sup>2</sup>TGM, No 4, 1958, p 122; No 4, 1959, p 122.

<sup>3</sup>This problem was discussed at greater length by E. Lysakowski: "Transport of Goods Covered by the First Polish-American Economic Agreement," TGM, No 7-8, 1958, p 203.

## POLAND

### Operational Data on Marcelli Nowotko Class Freighters

[This is a translation of an article by Zdzislaw Jedrzejowicz, Polish Ocean Lines, Gdynia, in Technika i Gospodarka Morska, Vol IX, No 12, December 1959, Gdynia, pages 376-378; CSO: 3618-N/2]

In November of this year three years had passed since the PLO [Polskie Linie Oceaniczne; Polish Ocean Lines] received the first general carrier of 10,000 deadweight tons (type B-54), called "Marcelli Nowotko." In 1957-1959 the PLO received eight more ships of this type.

The initial operating period of these ships should be defined as nontypical. The ships made voyages to the Far East, calling in Indian and Burmese ports, or made single voyages to US ports.

The operational profile of these ships was finally consolidated in the last months of 1957, from which moment all ships of the above series have found permanent employment on the East Asiatic line. After two full years of operational experience on this line, it is possible to attempt to sum up the results and to derive certain conclusions.

### Assumptions

The operational assumptions concerning ships of about 10,000 tons destined for construction in domestic shipyards, as follows from the records of the former CZ PMH [Centralny Zarzad Polskiej Marynarki Handlowej; Central Administration of Polish Merchant Marine] was calculated initially at the beginning of 1952. At that time, three basic routes of interest to Polish ocean shipping were taken-- that is, the region of India and Pakistan, the People's Republic of China, and South America. At that time the prevailing idea was to prepare a universal ship for ocean lines. It was to be a unit combining the advantages of a

true liner for general cargo with those of a tramp ship. The assumed unit, called a "tramp liner" of about 10,000 deadweight tons, as an open protective decker, with a maximum draft of 28 feet and a loading space of over 70 cubic feet per ton for cargo and a speed of about 16 knots, was to solve all the problems of the time. These assumptions created a foundation for designers for the first version of the B-54 ship.

Despite the use of the term "tramp-liner" and the tendency toward universalism, the planned unit gradually received more and more characteristics of a "cargo liner," and two or three years after the preparation of the first assumptions--that is, in 1954-1955--the elements of a tramp ship disappeared almost completely. The study for investment assumptions of the PLO for the 1956-1960 Five-Year Plan, prepared by the team of the Maritime Institute (Instytut Morski) in Gdansk mentions only a motored general carrier of about 10,000 deadweight tons for the Far Eastern routes.

All the operational assumptions prepared before the completion of construction of the first unit assumed a full coverage with export cargo from Polish ports to the Far East, and Dairen, Takubar, Tsingtao, Tsingwangtao, and Whampoa were planned as port of destination. The ships were not to call at any ports en route and the round trip was to be limited to about 23,600 sea miles. As we will see later, the reality departed considerably from these assumptions.

#### Actual Utilization

The East Asiatic line embraced a much wider region than the ports of People's China. At the basis of this change lies the increased sphere of interest of Polish foreign trade and the need for transit partners. The decreasing volume of export to China from Polish ports and the disappearance of reloading consignments (shipped by sea to Poland from Western Europe and then sent to China) created the need for direct calls in West European ports to supplement the cargo. Similarly, with the normalization of political conditions, it was possible to include Japan in the PLO service and to widen the activities in Indonesia, Malaya, Vietnam, and Hong Kong.

Actually, the East Asiatic line is exploited on two slightly different route variations. Ship "A," starting loading at the beginning of each month in Gdynia, serving Antwerp, Rotterdam, Hamburg, and Dunkirk, calls in Aden, Singapore, Bangkok, Haifong, Hong Kong, Yokahama, Nagoya, Koe, Hsinkang, and Shanghai. The ship returns to Gdynia via Singapore, Penang, Port Said, Amsterdam, and Hamburg. The length of the route is about 28,500 sea miles.

Ship "B," loading in Gdynia in the second half of each month, after supplements in Atwerp, Rotterdam, and Hamburg, sails via Port Said, Port Sudan, and Djibutti to Djakarta and Surabaya, and then via Hong Kong directly to Japan. Its return to Gdynia is made by the same route as ship "A". The route is a little shorter than the first one and amounts to about 27,500 sea miles.

The basic cargo of both alternatives in export are Polish and Czech products, consisting first of all of general cargo, automobiles, tractors, etc. The supply from Polish ports does not fill the loading space completely and supplements in Western Europe--mostly of general cargo and sometimes sheet metal and iron--are necessary. In import from the Far East, the cargo supply for Poland and Czechoslovakia covers the needs of the line. The valuable general cargo from Japan to the Continent is accepted because of its financial attractiveness.

The utilization of the ships on the line with regard to both carrying capacity and space, is high especially since we consider that the basic objective is to maintain regularity and therefore keep the dates of sailing according to a timetable, without waiting for cargo. In export from Europe the discussed general carriers of 10,000 dead-weight tons, whose loading capacities, after deducting fuel, water, and stocks, amount to about 9,100 tons, take not less than 8,000 tons of cargo. With regard to space, the utilization is generally higher. The ships have a loading capacity in the holds of about 601,000 cubic feet of bales; after deducting the free space necessary with numerous consignments, about 590,000 cubic feet are usually left. This space is usually at least 95-percent utilized and there are cases of 100-percent utilization.

In import from the Far East the situation is similar, but the weight utilization is slightly higher and the ships load 8,500 to 9,000 tons of cargo with full utilization of



space. It should be added that, particularly in export, the ships after freeing part of loading space--for example, in Port Sudan, Indonesia, or Vietnam--accept in its place cargoes for Japan and People's China, so that often the quantity of cargo carried in one trip considerably exceeds the carrying capacity of the ship.

The duration of the voyage basically influences the operational results, and since 1957 it has been showing a clearly falling tendency. The index for 1958 for the whole East Asiatic line was 201.7 days. The corresponding figure for the [first] three quarters of 1959 shows that the duration of voyages fell to 166.7 days. It seems that this is not the last word and that further cuts will be made possible by a proper choice of rotation of ships. The following example of the duration of voyage of a ship following route "A," which completed the round trip in 167 days after covering a total of 28,333 sea miles, gives a typical picture of the work of the general carriers:

	Days	Hours	Percent	Percent
Sea voyage	72	14	43.5	at sea
Approaches, maneuvers	7	07	4.4	47.9
Reloading in ports	75	18	45.0	
Taking on fuel	1	02	0.6	in ports
Stops, waiting	9	03	5.4	52.1
Clearance, etc.	-	5	0.1	
Total	167	01	100.0	

An important part in maintaining regularity is the speed of these ships. Practice shows that 17 knots is an attainable speed, but the timetable is calculated at an average of 16 knots, which contains some reserve for weather conditions and possible speed losses on return trips as a result of barnacles on the hulls.

#### Financial Results

Out of nine round trips completed in 1958, seven were profitable. Two trips brought losses as a result of overlong voyages--a consequence of stopovers. The results of the trips terminated in [the first] three quarters of 1959 show considerable stability of costs and freight revenues.

Out of the total of nine completed trips, eight were profitable and only one brought losses as a result of especially disadvantageous circumstances.

The share of foreign exchange costs with relation to the total costs is over 40 percent for 1959. Considering the large number of loading ports and destination foreign ports and the twice-repeated costs of the Kiel and Suez canals, and also fuel taken on mostly outside the country, the percentage of foreign currency costs is normal.

In the total costs, apart from expenditures connected with movement, there are markups on daily costs for the maintenance of the ship and crew, the share of the ship in the general factory costs, and depreciation fixed by state authorities. The fixed costs with depreciation planned for 1959 for general carriers of 10,000 deadweight tons amount to a little over \$1,200 a day, which is not a negligible sum. The costs are a result of the use of zloty-foreign exchange converters, but regardless of disproportions resulting from this, there are also objective reasons for the cost of maintenance of Polish ships being higher than that of foreign ships. This is first of all a problem of the large number of crew members. Until recently, the 10,000-deadweight tons general carriers employed 54 crew members, and only since 1959 has this number fallen to 44 crew members plus possibly four trainees. For the sake of comparison, it can be said that Scandinavian or West German ships of the same class have a crew not exceeding 35 to 36 persons. Large crew increases the food costs, to which we must add the not always rational high nutrition norms. In purchases of food in Poland the conversion of prices into foreign currency gives unexpected results. Similar is the case of purchases of technical materials at domestic prices and expenses for repairs invoiced in current zlotys. The daily costs of ships are also influenced by the maintenance of seamen reserves and contributions for the crew apart from wages, in the form of cultural and educational activities, etc.

Summing up the individual elements discussed above, we can see that the 10,000-deadweight ton general carrier is not an inexpensive ship under Polish conditions and its daily cost at sea, considering the consumption of about 28 to 30 tons of Diesel oil is about \$2,200.

## Technical and Operational Advantages and Disadvantages

What, therefore, should explain the fact that, despite the depression on the freight market, most of the round trips in 1958-1959 were profitable? It seems that the answer lies in the technical advantages of the ship and its usefulness for the route on which it runs. With regard to hull construction, the first ships--that is MS "Marceli Nowotko" and MS "Boleslaw Bierut"--gave reason for some criticism. It turned out that in transporting heavier cargoes--for example, magnesite or concentrates as partial cargoes of several thousand tons--disquieting vibrations of the hull appeared, distinct from normal vibrations. Additional horizontal reinforcements used on further ships eliminated these phenomena and, after the construction of reinforcements on the two first ships, on the occasion of the next four-year check the problem will be liquidated.

In general, our 10,000-deadweight ton general carriers do not offer easy stowing, especially when the majority of cargoes consists of bulky goods. The calculation of correct stability requires considerable experience, and the proper distribution of cargo has a decisive influence on the operational results. Practice has shown that with uniform cargo--for example, of cotton, even after filling all ballast containers, the stability was hardly sufficient.

The absence of double twin decks on ships of the B-54/I series, with specific utilization, when the ship constantly receives and accepts general cargo in ports, makes the tasks of the loading officers difficult. The stowing problems were simplified by the installations on the subsequent ships (series B-54/III)--that is, "Jan Matejko," "A. Warski," and "E. Plater" with double twin decks. But it could be remarked that the height of the twin decks was not too well calculated. Two meters of height in No 3 hold and 2.08 meters in No 2 hold is in practice too low to allow free manipulation in loading such items as automobiles, which appear more and more often as a line cargo. It seems that the height of the twin decks of about 2.40 meters, even at the expense of the lower part of the hold would give better results.

The valuable characteristic of the holds of the ships under discussion is their large space, permitting the ships to be loaded with highly valuable bulky general cargo.

It is not necessary to look very far for proof that the main advantage of these ships is their space. Apart from the nine ships of the "Marceli Nowotko" type, the "Kilinski" (of the "Victory" type) is operating on the line; of wartime serial production, it has many characteristics such as carrying capacity, speed, daily cost of fuel, etc. in common with the 10,000-deadweight ton general carriers. But from the space point of view, the "Kilinski" can accommodate only about 450,000 cubic feet of bales as compared with about 600,000 on our new ships. As a result of the above, while the new ships as a rule end the voyages with a profit, each round trip of the "Kilinski" brings a serious loss.

As to the main engines, it must objectively be stated that the first six ships, equipped with Fiat engines, despite reservations that their type is obsolete and fuel consumption high, give trouble-free operation. There are some skeptics who maintain that the difficulties will start after a few years of operation, but so far the results have been good--which cannot be said about three units of the B-54/III series equipped with engines on the "Sulzer" license built in Holland by the Werkspoor Company. All three units during the first roundtrip had breakdowns of the main engine, causing stops from a few to several days. Possibly these difficulties will be eliminated by the designers, but it must be realized that breakdowns of new ships, even when not the fault of shipyards, cause widespread and unfavorable comments.

The technical evaluation would not be complete if we did not mention the ship's winches. Starting with the second unit, winches of domestic construction were installed which did not fully pass the test, particularly in tropical climates, giving much trouble and work to the electricians. In addition, the slow rotating winches produced by Polish industry slow down the speed of reloading work. This was particularly evident during trips to the United States where winches are as a rule used and where additional supplements to the reloading rate were demanded in connection with the insufficient utilization of workers as a result of too slow winches.

Much justifiable criticism is caused by the not very careful finishing of interiors of ships. Particularly on the first ships there were numerous instances of not tight portholes, of breaking of badly fitted glass, of plastic

covering on floors coming off, linings on walls and doors of passenger and crew compartments falling off, and several small shortcomings which bother the crew and contribute to a superficial but general criticism of Polish shipbuilding. In the eyes of other nations, not always friendly, these neglected details obscure the actual good factors, such as the ingenious design solutions, the attractive silhouettes of the ships, and their obvious operational advantages, which are usually appreciated in professional shipping circles throughout the world.

### Development of the Concept

The B-54/III series--that is, the "Jan Matejko," "Adolf Warski," and "Emilia Plater"--to which in 1960 will be added the M. S. "Janek Krasicki" and a further unit still unnamed from the Szczecin Shipyard, constitutes an intermediate type between the group of the first six ships of the B-54/I and the further B-54/VIII series, which will be initiated by the MS "Pekin" and MS "Hanoi," now under construction in the Gdansk Shipyard.

The line of consistent evolution which we observe from the assumptions of 1952, through the "Marceli Nowotko" general carrier of 1956 and the modified general carrier "Jan Matejko" of 1959, leads to the B-54/III series, constituting probably the final variation of the initial concept. Design changes clearly went in the direction of obtaining a ship as close as possible to the typical cargo liner used generally in world line shipping.

One of the changes in the B-54/VIII ships consists of a different location of the bunkers. Instead of using the present high bunkers in the machine room, they will be located in double bottom bunkers under the No 3 hold. In effect, this will decrease the area of the machine room and create possibilities for obtaining an added 20,000 cubic feet of loading space when the ship is not utilized in [maximum] weight.

A further change is the transfer of two tanks with a capacity of about 1,000 cubic meters for liquid cargoes from No 3 hold to No 4 hold, and placing them horizontally along the tunnel. Without changing the capacity of the

tanks, each of them will be tightly divided, making it possible to ship four separate liquids.

As a further innovation, cooling chambers were planned with a total capacity of about 35,000 cubic feet which will be located on the second twin deck of No 3 hold. The cooling compartments, in view of the constant demand for shipments of frozen eggs, meat, and poultry from Chinese ports, will be fully utilized in the East-West run. Sometimes these compartments will be used for carrying fruit, not only from East to West but also in reverse direction. Despite the comparatively high cost of refrigerator installations, this will certainly be a profitable investment permitting a further improvement of operational results.

In view of the chronic nonutilization of the 12 passenger accommodations of the present ships, it was decided to limit it to a two-person ship owner's cabin and two single passenger cabins. The partial liquidation of the unprofitable passenger accommodation will improve the crew's living conditions. With respect to the latter problem, the new ships, beginning with the B-54/III series, are equipped with air conditioned crew's quarters--a very important element in work in the tropics.

The described construction postulates of the shipowner already accepted by the shipyard industry, and also further changes such as lengthening of the second twin deck in No 1 hold, the strengthening of the protective deck to a weight of 2 tons per square meter, replacement of winches by more efficient ones, a different set-up of electricity generation assemblies, etc., will in effect give the shipowner a unit still better adapted for the needs of the East Asiatic line.

### Conclusions

The remarks and observations formulated above were made by the author on the basis of several years of daily contacts with the crews, agents, loaders, etc., both in Poland and abroad, and it seems that the following conclusions could be drawn:



1. To the question of whether our 10,000 deadweight ton general carrier is a proper ship for the East Asiatic line, the answer is undoubtedly positive. Operational practice has shown along which line the technical evolution of the specifications of ships for the Far Eastern region should go and each subsequent series of these ships tends in its improvements in the direction of a line ship adapted for transportation of highly valuable cargo.

2. It is not an inexpensive ship, in terms of either the daily costs of maintenance or fuel consumption. Neither is this a universal ship, and thus profitable operation cannot be expected when low rate bulk products are shipped.

3. However, if the ship is operated in accordance with the assumptions--that is, with shipments of highly valuable cargo, Polish or foreign--it can easily earn considerable foreign exchange surpluses, constituting a form of export of services, with the cost of earning a dollar--on the basis of the experience of several trips--amounting to 15 to 18 zlotys.

4. A total of 20 of these ships, according to assumptions of fleet development, are to supplement the PLO tonnage by the end of 1965. In comparison with the present number, this means that the shipper will take over 11 ships from Polish shipyards in the coming years. Knowing by experience the tendencies of shipyards to complete plans at the time specified even at the cost of quality, it appears that a considerable strengthening of investment supervision of the shipowner over the shipyards and the extension of this supervision to engine producers would be desirable. Proper supervision will free the shipowner from the situation in which he finds himself every time that, having contracted for cargo, he accepts a ship in spite of having found some defects during tests--even serious defects, as was the case with MS "Emilia Plater."

It was stated above that the general cargo usefulness of 10,000-deadweight ton for the Far Eastern route is unquestionable under present conditions. But could this statement be expanded and the conclusion drawn that it will be so during the next twenty years? To answer a question of this kind is very difficult. In the report of the Maritime Institute of 1954-1955, the first doubts concerning this unit were already voiced. The report contains a remark that a ship for the Far Eastern run should be

slightly larger and its speed should be about 18 knots. Probably, after the present series of ships, the B-54/VIII version of which is to be the last stage of their development, it will be desirable to start the preparation of technical and operational assumptions for a new, larger, and faster unit.



## POLAND

### The Port of Szczecin and Inland Navigation

[This is a translation of an article by Magister Tadeusz Kowalski of Szczecin, in Technika i Gospodarka Morska, Vol IX, No 12, December 1959, Gdynia, pages 378-379; CSO: 3618-N/3]

From year to year the turnover of our seaports increases and from year to year the difficulties grow because of the insufficient number of railroad cars. While in previous years these difficulties usually appeared only in the ports themselves, at present there are often shortages of cars far inland, in the production plants sending export goods to Szczecin.

It comes to mind that the lack of sufficient participation of inland navigation in serving the port, with conditions favorable for this, is a factor that slows down harmonious cooperation with the hinterland and at the same time creates imbalances in the port itself. The participation of inland navigation ships in serving the Szczecin port is small in comparison with [their services to] the West European ports. According to data once published in TGM [Technika i Gospodarka Morska] (No 4, 1958), the share of inland navigation in the service of general port turnover was as follows in 1956:

	Percent
In Szczecin	14.7
In Hamburg	22.9
In Bremen	43.8
In Rotterdam	52.4
In Antwerp	62.5

In the ports listed, in Rotterdam, besides inland navigation, road transport is predominant, serving 41.6 percent of the turnover (railroad only 6 percent).

From the above figures it can be concluded that a very strong emphasis is placed on inland navigation and road transport in serving the largest ports in Europe. In Poland the best conditions for inland navigation are enjoyed

by Szczecin, but only 14.7 percent of its turnover is served by barges. In comparison with Hamburg, this share is 36 percent less, Bremen 66.5 percent, and Rotterdam 72 percent (taking the barge turnover of these ports as 100).

In the service of the Szczecin port the basic means of transport is still the railroad car, despite the fact that in other ports this means was long ago replaced to a large extent by trucks, and the constantly increasing number of barges decreases the railroad share in port service to an indispensable minimum. Thus, it is no wonder that with such ratios the problem of shortage of cars for the service of foreign trade products has become for us a bottleneck which hinders normal port work.

The chief user of the Szczecin port often points out this problem and Szczecin shippers complain of lack of cars. In the third quarter of this year the Szczecin port failed to receive for loading the following cars ordered from the PKP [Polskie Koleje Panstwowe; Polish State Railroads]: July, 324; August, 2,174; September, 4,624.

The shortage of freight cars is not going to end and the Railroad Ministry (Min, Kolei) states officially that this situation will not change in the near future. For this reason the port's difficulties in delivery and receipt of goods should be solved, among other things, by increasing the share of barges in serving the port.

Having this in mind, the Polish Foreign Trade Chamber (Polska Izba Handlu Zagranicznego) in Szczecin is considering the possibility of increasing the share of barges in serving the Szczecin port by introducing regular shipments of general cargo on the Oder by the "Navigation on the Oder" ("Zegluga na Odrze").

On the basis of materials collected by PIHZ [Polska Izba Handlu Zagranicznego; Polish Foreign Trade Chamber] it is possible to state that in shipments on the Oder cargoes of both foreign (Foreign trade and transit) and domestic turnover participate.

Cargoes of foreign turnover which could be sent for shipment on the Oder were as follows in 1958:

	<u>Tons</u>	<u>Total</u>
Export		91,615
a) domestic	76,615	
b) transit	15,000	
Import		118,000
a) domestic	78,000	
b) transit	40,000	

These figures include first of all general cargo (bristles, saltpeter, plates, zinc, pails, machines, sugar, malt, glass, paper, beans, nonferrous metals, etc.) in sacks, bundles, and boxes. The figures given do not include Czechoslovak transit which could take advantage of such shipments under favorable conditions.

The estimate of the domestic mass of goods is as follows:

a) Down-stream (to Szczecin)	32,490 tons
b) Up-stream (from Szczecin)	2,875 tons

This includes sheet metal, washing machines, enamel, refrigerators, nails, foundry products, wine, paper, industrial installations, etc. As concerns this cargo, it should be noted that its suppliers are mostly the same plants which supply foreign trade goods or are recipients in import.

Thus, several metallurgical plants in Silesia supply sheet metal and iron products for both export and for the Szczecin Shipyard (Stocznia Szczecinska), the Szczecin Factory of Construction Machines (Szczecinska Fabryka Maszyn Budowlanych), the Szczecin Repair Shipyard (Szczecinska Stocznia Remontowa), etc. The "Silesia" Metallurgical Plant in Rybnik is a supplier of pails and enamel products for both export and for the "Arged" Wojewodztwo Enterprise of Wholesale Household Articles (Wojewodzkie Przedsiębiorstwo Hurtu Artykulami Gospodarstwa Domowego) in Szczecin. It should be stressed that several plants in Silesia could deliver their products directly to the barges if they were adapted for reloading into ships. In other cases the transport would go by rail-water route. This problem also concerns the Szczecin Shipyard, a large consumer of Silesian products (about 25,000 tons of metallurgical products per year), which at the present moment is not adapted to receiving goods sent by water.

Apart from the quantity of goods, there are additional factors on which the opening of regular commercial shipping on the Oder depends. Among these factors are:

- a) the number of inland navigation vessels that will be at the disposal of general cargo shipping;
- b) the reloading possibilities in river ports and in Szczecin;
- c) organizational problems.

"Navigation on the Oder" says that in connection with the construction of a series of 500-ton motor barges it will already be able to start such shipping in 1960. At that time this enterprise will possess 47 standard covered motor barges with a total capacity of 22,260 space tons and a carrying capacity of 377,000 tons per year. "Navigation of the Oder" is ready to devote some of these barges for general cargo shipping in regular navigation.

It seems that the evaluation of its own possibilities by the "Navigation on the Oder" is realistic. The attempts at general cargo shipping so far have shown that, without a sufficient number of barges devoted exclusively to similar shipments, it would not be desirable to start the organizational efforts connected with its opening.

It can be stated on the basis of experiences so far that the inland ports of Gliwice, Kozle, and Wroclaw are in principle ready for the necessary reloading work. However, the attitude of the Szczecin Port Administration (Zarząd Portu Szczecin) is still not clear--that is, it is not known whether it will grant for the discussed shipments the privileges extended for sea line shipments and whether it will be able to ensure space for inland barges on general cargo embankments, efficient reloading with cranes, etc. It seems that this factor would be decisive in instituting the discussed shipments.

Another problem will be the preparation of "Navigation on the Oder" to serve goods from the dispatch point of view in inland ports. Undoubtedly, for the shipments under discussion the outlay of work of inland ports will be greater.

Taking into account the requests of domestic customers, it must be remembered that domestic goods will also participate in the shipments. It follows from the work of MRN [Miejska

Rada Narodowa; Municipal People's Council] in Szczecin that in the near future the so-called municipal port will be opened. In view of this, in its organizational work, "Navigation of the Oder" must take into account the necessity of serving with one ship both the city embankments and the commercial port.

Water shipment of the above-mentioned products would greatly relieve the railroad. In transport to Szczecin about 5,300 fewer cars would be used (91,615 tons + 2,875 tons = 94,490 tons, which, with the average loading capacity of cars amounting to 15 tons, constitutes 6,293 cars). In shipping goods from Szczecin it would be possible to eliminate orders for about 10,000 cars (118,000 tons + 32,490 tons = 150,490 tons: 15 tons = 10,032 cars). It should be stressed that these figures, with regard to both the quantity of goods and the cars necessary for transport, are not final because, with the stabilization of the proposed shipments, both coefficients will have a rising tendency.

### Conclusions

1. On the basis of materials given by the PIHZ, it can be considered desirable to open regular commercial shipping on the Oder.

2. The "Navigation on the Oder" should officially apply to the Szczecin Port Administration for registration of the discussed shipping line and conclude an agreement on cooperation. The same will apply to the domestic goods, which should be discussed with the Presidium of MRN.

3. "Navigation of the Oder" should prepare a timetable listing the barge service of inland ports and Szczecin port and offer it for acceptance to the interested parties--that is, shippers and port administration.

4. If there are no basic obstacles, regular commercial shipping on the Oder should open in March 1950.

It should be realized that the introduction of the discussed shipping will not wholly solve the problem of car shortage, but it will contribute to increasing the participation of barges in port service. Thus, a certain number

of the cars will be available for transport of goods which cannot be shipped on barges and thereby lessen the shortage of cars.

## POLAND

### Review of a New Book on Poland and the Baltic

[This is a translation of an article by Magister Czeslaw Wojewodka in Technika i Gospodarka Morska, Vol IX, No 12, December 1959, Gdynia, pages 387-390: CSO: 3518-N/4]

In the Polish maritime literature there is still a shortage of popular scientific works on historical and economic problems, while technical problems are already comparatively well represented. In connection with this it seemed that the new edition of the well known book by H. Baginski, Polska i Baltyk [Poland and the Baltic], with a note that this is "a revised third edition," might fill this gap. Unfortunately this is not the case. The first more serious maritime book from "Book and Knowledge" ("Ksiazka i Wiedza" Publishing Enterprise) is a failure.

Despite the revision, the book bears an excessive carry-over from the previous editions, concerning various political and economic conditions. In addition, there are disproportions in the space and method of treatment given to individual sections, errors in composition, inconsistencies, and, unfortunately, a great many common errors concerning problems of maritime economy. Improper terminology, much obsolete data, and superficial, declarative treatment of several problems complete the negative evaluation of this new publishing item.

Without dealing here in more detail with historical problems, which require evaluation by an expert historian, I would like to devote some space to a discussion of the economic and maritime problems of the book. The work consists of three "books," entitled as follows:

1. Poland's Economic and Geographic Individuality
2. German Pressure to the East
3. Poland's Maritime Economy

The first book is devoted to geographic problems of Poland and the Baltic and contains a brief history of the commercial routes in Poland.



It is with surprise that we find in this section a subchapter on "The Arctic--the Country of the Future," which has little in common with Polish maritime economy. Furthermore, if the author is to deal with the Arctic, the description cannot be limited to the history of its conquest in the sixteenth to nineteenth centuries and the history of Polish Arctic expeditions. The problem of Soviet Arctic conquests was completely ignored (despite the fact that the bibliography given at the end of the book lists seven books on the subject). On the other hand, the history of Polish Arctic expeditions ends in 1936, though at present such expeditions are also taking place.

In discussion of the Kiel Canal, we are shocked by the statement that "thanks to this canal, Hamburg almost became a Baltic port" (p 31), because such an argument is more proper for the German mentality, which has in a similar way justified the lack of purpose in developing ports of the Baltic countries (particularly East Germany and Poland) because their sea trade can be served by Hamburg. One is surprised by the justification of the "Baltic nature" of Hamburg by H. Baginski, who writes that this happened because "before the Second World War the traffic of ships in the Kiel Canal to and from the Baltic was 23.3 million gross register tons." It seems that this has nothing to do with the "Baltic nature" of Hamburg, because these ships did not, at the same time, call in Hamburg but served the exchange of Baltic countries with other ports and countries in Europe and outside Europe, which now takes place to a still greater extent than before the war.

The subchapter, "Routes of World Shippin," is full of simplifications. For example, it states concerning shipping that "it can develop in countries which have something to trade with or need exchange products from other countries" (p 45). And intermediary fleets? It is not necessary to reach for the problem of "cheap flags"; the example of Norway, close to us, whose fleet "does not fit" in the definition of H. Baginski, is sufficient.

In the list of the Baltic countries we read with surprise that they consist "partly of Germany, Denmark, Sweden, Finland, and the Soviet Republics: Estonia, Latvia, Lithuania, and Soviet areas near Leningrad and Kaliningrad" (p 49). Why is it not said clearly that the Baltic states are not "partly Germany" but East Germany and "partly West Germany?



(As a matter of fact, East Germany is also omitted on a map on p 10.) Are Estonia, Latvia, and Lithuania not "Soviet areas"?

One of the subchapters of this book is entitled "Economic Hinterland of Polish Ports on the Baltic." The title is illogical to say the least; and besides the subchapter is devoted to inland navigation routes leading to the ports.

The summation of the first book consists of several theses which give rise to numerous questions. For example, the author writes that "Poland...takes advantage of the freedom of the seas and oceans for her shipping and for scientific Arctic studies and fishing" (p 73). Why Arctic studies in particular? Another thesis maintains that "the highest commodity turnover is shown by ports on the southern shore of the Baltic." This is not an up to date statement; this was true before 1939. The turnover of ports is connected not only with their location but also with the economic structure of the countries served by them, and especially with the direction of their international exchange. Changes also take place in foreign ports. Thus, for example, the turnover of Copenhagen is higher than that of any Polish port.

The second book embraces the problems of the German "Drang nach Osten." It should be analyzed by historians. However, it must be stated that this part is not properly treated because the problem of "Poland and the Baltic" is not limited solely to struggle against the "Drang nach Osten." The book lacks a discussion and evaluation of Polish maritime undertakings in past centuries, while the remaining historical problems are treated in too much detail.

The basic part of the book falls to Book Three, devoted to problems of contemporary Polish maritime economy. Unfortunately, most of the reservations are about this part. First of all, we find nowhere any attempt to define maritime economy, and numerous misunderstandings arise in connection with this. In addition, there are disproportions in the treatment of individual problems of maritime economy and scores of errors.

Book Three opens with Chapter VI, entitled "Economic Foundations of Poland's Overseas Trade." It could be assumed from this that the chapter will discuss the premises for the development of Polish shipping and ports. However,

the first subchapter already ends these illusions because its title is "Tasks of Maritime Economy." But in spite of its title, it is devoted mostly to economic activation of the coastal region interpreted very widely, including Olsztyn and Bydgoszcz Wojewodztwos.

This subchapter not only departs from the subject but also contains several erroneous formulations. Examples: "[Poland's] own fleet is as a rule unable to serve 100 percent of the tonnage passing through the ports" (p 163); this is inexact; see only the already mentioned Norway, whose fleet would be able to do this, but it is not the impossibility of serving ports wholly by our own fleet that is involved here but the conditions of international exchange. The second example: "The maintenance of ports in a proper state is the greatest concern of maritime economy" (p 163). The proper development of maritime economy requires a proportionate development of its individual branches; why should the port enjoy a privileged position in this?

It is still necessary to add that the problems of activation of the coastal region is "idealized" here. Unfortunately, our maritime economy does not exert any major influence on this region; its influence is limited to a narrow coastal belt, and the central and southern regions of the country are more connected with maritime economy (main industrial centers connected through supplies and sales with ports) than the nearest hinterland of the ports. In the light of these theses, the statements of H. Baginski about maritime economy as a workshop for hundreds of thousands of men (in addition, we should bear in mind that maritime economy is not characterized by high labor absorption indices) and about the ties of nearly one-fourth of the country with maritime economy do not stand up.

The second subchapter of Chapter VI is devoted to the "necessity of increasing the activity of maritime economy." It opens with a statement which cannot fail to create serious doubts: "The economic upheaval which took place in Poland in October 1956 attracted the attention of the society, among other things to our maritime economy, which was expressed in numerous articles in the press and in lectures and discussions during the Congress of Maritime Economists (Zjazd Ekonomistow Morskich) held in Sopot on 1-3 March 1957" (p 166-167). If this were really so, our maritime economy would continue in an unhappy situation, for the "upheaval" would be limited to a great many words. Meanwhile, after

October, the maritime economy was influenced not only by words but also by deeds, and it would be necessary to mention the latter in the first place.

However, in the subchapter with the above-mentioned promising title we find three statistical tables depicting the development of Polish foreign trade in 1955-1957, general remarks about its structure, given for comparison (but not comparable!) figures for the interwar period, and the conclusion that "the export of our industrial products to non-European overseas countries should be developed through expansion of our own fleet" (p 159) and also that "trade follows the flag" (p 171), not to mention such a statement as "the future of our country and the welfare of present and future generations depends to a large extent on whether we succeed in devoting the majority of our effort to problems connected with intensive and allsided 'cultivation of the sea'" (p 171).

The third subchapter of Chapter VI is entitled "Transit through Polish Territory and Polish Ports." The two problems mentioned in the title are not of equal order: it is obvious that transit through Polish ports constitutes a part of the transit through Polish territory. However, the basic part of the transit through Polish territory (East-West transit) does not use port services, and for this reason it was treated superficially. Unfortunately, even in these superficial remarks there are errors. For example, on page 171 the author writes that "in the near future shipping is to open on the Berlin-Krolewicz (Kalinin-grad) line...." This shipping has been open for two years. Next, we read: "Railroad transit in the West-East direction goes on the Berlin-Gdansk-Krolewicz lines, also through Chojnice and Tczew..." Transit was carried out along these routes, but only before the war and, in addition, there was never a direct connection from Berlin to Krolewicz through Gdansk--impossible from the technical point of view.

The problems of transit through Polish ports are presented in a statistical and postulative way--that is, by describing the development of this transit in the interwar period and in 1951-1957 and by enumerating the generally known (and hardly concrete) postulates concerning the further development of transit--for example, "it is necessary to start intensive activation of transit, particularly Soviet, Czechoslovak, and East German transit"; "it is necessary to relieve the railroads and to develop inland navigation"

(p 173), etc., etc. In discussing the problem of transit through ports, the author failed to avoid errors. For example, on page 174 he writes that "Scandinavian countries take advantage of Polish ports in transit... sending general cargo via our regular lines to distant countries." It could rather be said that the situation is the opposite, because the network of regular lines in our ports is much less dense than in the main Scandinavian ports. Scandinavian maritime transit through our ports was exceptional in the past years, when our fleet occupied a "monopolistic" position in shipments to and from China, but this already belongs to the past.

One is most surprised by the calculation of "total potential possibilities of development of transit through Polish ports" at 2.6 million tons (p 178). This magnitude was already exceeded by our ports in 1958 and this year transit will be still higher.

Chapter VII is devoted to Polish maritime transport but, apart from shipping, it discusses the problems of the Polish Ship Rescue (Polskie Ratownictwo Okretowe), the Enterprise of Drugging and Underwater Jobs (Przedsiębiorstwo Robot Czerpalnych i Podwodnych), the cooperative "Ship Service," etc. The main shortcomings of this chapter are as follows: on page 180 the author writes that "at the present moment there are under construction about 24 million gross register tons (on the world scale). Apart from the incorrectness of such a formulation in the book (what is "the present moment"?), it should be pointed out that never in history has world shipping construction had such an amount of tonnage under construction. The maximum magnitude was attained in 1958 (10 million gross register tons).

The problem of financing shipping development in Poland is presented incorrectly. From the description of the author (p 182) it is possible to draw the conclusion that investments in the fleet have to be financed by the shipping enterprises themselves, that they are not included in the state investment plan. Incorrect also is the quoting (p 184) of the Resolution of the Parliament concerning the development of maritime economy, while the author has in mind the resolution of 12 July 1957 on the plan of economic development in 1956-1960, the decisions of which are quoted inexactly.

Despite the fact that the first subchapter of Chapter VII is entitled "The Plans of Development of Polish Maritime Shipping," we find in it only information concerning the fleet by 1960, completely ignoring longterm plans.

The state of the Polish merchant fleet in 1939 (presented unfortunately only in a footnote, as is the whole postwar development of the fleet) is unintelligible. The author writes that at the outbreak of the war the PMH [Polska Marynarka Handlowa; Polish Merchant Marine] possessed 96 units with a tonnage of 135,110 gross register tons, and then he says that in 1939 a total of 39 units with a tonnage of 120,006 gross register tons sailed under the Polish flag. Should we conclude from this that 57 units with a tonnage of 15,104 gross register tons (the difference) constituting the property of PMH sailed under a foreign flag?

Also, in discussing the tanker tonnage, the author did not avoid errors. On page 187 he writes that "under construction there are 25.5 million tons" of tankers (since in the previous sentence he says that the world tonnage of tankers already exceeded 28 million gross register tons--to be exact, in the middle of 1958 it was nearly 34 million gross register tons--we conclude that the state of tankers under construction is also given in register tons). Such a large tonnage of tankers was never under construction (at most it was 5.5 million gross register tons in December 1958); neither did orders for tankers ever reach 25.5 million gross register tons.

About super-tankers, the author writes that they are adapted solely for USA ports. This is wrong information, since a ship must be adapted for both loading and unloading ports. In addition, what is involved in the case of super-tankers is not adaptation to ports of some specific country but rather to a certain maximum depth of ports and channels, which should be explained in more detail.

Booking (p 190) is defined as "loading general cargo on ships of a regular line" (?!); mentioned as one of the duties of a clearing broker is clearing the port!

Another surprise is the detailed listing of the distribution of PLO [Polskie Linie Oceaniczne; Polish Ocean Lines] and PZM [Polska Zegluga Morska; Polish Maritime Shipping] ships among individual regular lines, though it

is known that constant changes take place in this respect. The footnote on page 193 stating that "during printing changes took place in the timetable of shipping lines" does not excuse this. With regard to information of this kind, one should use the general tonnage on individual lines rather than specific ships.

Although there is a subchapter on "Plans of Development of the Polish Maritime Shipping," information on plans of fleet expansion for 1961-1965--unfortunately not very correct--is found in the subchapter, "Service Enterprises of Maritime Shipping" (?!).

From the references to shipping conferences on page 194, one could draw the conclusion that the author considers them to be meetings during which freight rates are fixed !. With regard to the "Ship Service" cooperative, he gives obsolete information on the cooperative maritime fleet.

About the PRO [Polskie Ratownictwo Okretowe; Polish Ship Rescue] he writes that, apart from rescue activities, "it can perform several tasks of a commercial nature," such as towing, recovery of wrecks, etc., from which it would follow that rescue activities can have no commercial character. The information that for the PRO "two modern rescue ships were recently ordered in an English shipyard" (p 196) creates basic doubts, because these ships had already started operation in 1958 and 1959, so that the word "recently" can apply at best to 1957, and the book appeared in 1959.

Chapter VIII is devoted to Polish ports and includes the following subchapters: "The Tasks of Polish Ports," "Loading Turnover in Polish Ports," "The Main Ports of Poland."

In discussing the tasks of Polish ports, the author writes (p 199) that "in capitalist countries the hinterland may be uncontroversial--that is, monopolistic, and controversial--that is, common," though this applies equally to socialist countries, the ports of which also try to obtain cargoes of the common hinterland (transit).

In the first subchapter of Chapter VIII we also find a general discussion of the equipment of ports. Here we encounter such statements as "the main basis of the capacity of the port is the railroad junction in the port areas" (p 200),



which is an incorrect statement because in many ports it is not railroad transport but inland navigation that is of decisive importance. Also improper is the statement (p 200) that "the task of the port is the organization of water transport" (?).

Also included among hydrotechnical constructions constituting a part of ports are shipyard installations. In this chapter too there are errors. For example, lifts are explained as installations "serving to combat the action of water in destroying embankments" (!!).

On reloading equipment the author writes in a very simplified way (p 201) that "before the war 286 cranes were operating in our ports; at present only 187 are working and these are mostly obsolete because the withdrawing Germans destroyed the most modern ones." And what about postwar reconstruction?

About port workers, H. Baginski writes that "they work under conditions similar to work in industry" (p 201), and it is well known that the situation is slightly different. It is also improper to generalize certain irregularities to the level of a general principle: "transfer of skilled workers in case of urgent need from one port to another safeguards the continuity of their employment" (p 201-202). Besides, what is the meaning of "from one port to another?" Is it also from Gdynia to Szczecin?

The author incorrectly identifies the loading turnover with reloading capacity, writing that "after regaining the coast in 1945 the aim was to attain the prewar reloading capacity, which was 25,134,000 tons..." (the sum of the turnover of Gdynia, Gdansk, Szczecin, and small ports in 1938).

The subchapter, "Main Ports of Poland," contains descriptions of ports in Szczecin (two and a half pages), Gdynia (one page), and Gdansk (three and a half pages), and plans of these ports. One has reservations about the disproportionate descriptions of these ports (it is worth stressing that the small ports discussed in another place received one page each--that is, as much as Gdynia), and about the inconsistencies with regard to previous chapters. Unfortunately, there are errors here too.

With regard to Szczecin the author writes that "in the near future Szczecin will become a port of the whole western and southern Slavic region..." (p 107), without taking into account the fact that other ports of Southern Baltic are also developing.

On the port of Gdansk we read (p 215) that "the Motlawa... constitutes an important part of the port," which is not true. In view of the historical interests of the author, one is surprised by the statement (in the same place) that "until 1845...the mouth of the Vistula was still between Westerplatte and the Wislouchskie fortress..." while since the end of the eighteenth century commercial ships have not used this entry. In discussing the development of investments in the Gdansk port, the interwar period was completely ignored (the Mining Basin, Westerplatte).

In descriptions of individual ports, one is surprised by the inconsistent attitude of the author toward the same problems. Thus, on page 201 the author writes that Polish ports are experiencing a shortage of cranes and warehouses, and on pages 210 and 213 we read about Szczecin and Gdynia as modern, excellently equipped ports!

The problem of sea fishing is discussed in Chapter IX in the following subchapters: "Economic Importance of the Development of Sea Fishing," "Economics(!) of the Sea Fishing Industry," and Polish Fishing Ports in the Baltic."

The first of the Subchapters discusses rather extensively the problems of world sea fishing.

Seriously misleading is the next subchapter entitled "Economics of Sea Fishing Industry." Quite apart from the improper use of the term "Economics"--for the author probably does not have in mind the science of economics--it has to be pointed out that the whole subchapter is devoted to the technique of sea fishing--that is, tools for fishing, types of fishing vessels, processing, etc., and some of these problems are discussed at length. In connection with this, one wonders why the technical and technological side of fishing is discussed at such length, while these problems with regard to shipping, ports, and shipyards are neglected. On the other hand it is possible to ask whether in a work of this kind it is at all necessary to discuss technical problems and whether it is proper that as many as 13 pages were devoted to them in the case of fishing.



The tenth and final chapter of the book is devoted to the Polish shipyard industry (not a very exact title, since it concerns the ship [building] industry--that is, shipyards and collaborating enterprises). The author discusses these problems in three subchapters: "The Tasks of the Polish Shipyard Industry," "The Organization of the Shipyard Industry in Poland," and "Development of the Polish Shipyard Industry."

The first subchapter presents, among other things, the development of Polish shipbuilding industry and certain problems of technical progress in world and Polish ship construction. Unfortunately, here too we encounter numerous errors and simplifications. For example, the author writes (p 248): "From the Economic point of view, ships of larger tonnage are profitable in operation in the merchant fleet." This is a simplified statement because large ships are profitable, but only under specific conditions. However, on the basis of his incorrect statement, the author formulates his next conclusion--also not quite correct--that the future task of Polish shipyards is to construct larger ships than before, mostly tramps with a carrying capacity of 12,000 to 14,000 deadweight tons and larger tankers with a capacity of 35,000 deadweight tons, and 100,000 to 200,000 deadweight tons. The task of shipyards is to construct ships for which there is demand on the part of domestic and foreign shipowners. Among the types of ships listed by the author, there is a definite demand only for large tramps, but there is no demand (in the form of orders) for super-tankers.

The short subchapter on the organization of the shipyard industry in Poland contains numerous errors. The proportions are glaring: the Gdynia Shipyard was allotted five lines, the Paris Commune Shipyard (Stocznia im. Komuny Paryskiej) 12 lines, and the Central Bureau of Ship Designing (Centr. Biuro Konstrukcji Okretowych) as many as 15 lines.

Inexact information was given about the Gdansk Shipyard: that it has runways for the construction of ships from 3,200 to 35,000 deadweight tons (cannot smaller ships be built on these runways?!) and that it has runways for side launching of ships of up to 600 deadweight tons (whereas at present 1,200-deadweight ton ships are launched on them).

For the Paris Commune Shipyard the author postulates the construction of two runways for super-tankers of 100,000 to 200,000 deadweight tons, although it is generally known that the best installation for large ship construction is a dry dock, the construction of which was decided on for the Gdynia yard.

About the Szczecin Shipyard we learn, among other things, that "under construction are two runways of the former "Wulkan" shipyard on which it will be possible to construct ships for export up to 20,000 deadweight tons" (p 251). What is the difference between the technology of ship construction for export and the technology of ship construction for domestic use?

In discussing the development of the Polish shipyard industry, the author lists, among other things, nonexistent shipyards in Elblag and Swinoujscie. The enumeration of ships constructed by Polish shipyards is also erroneous because the list includes ships which are planned to be constructed in future years, which fact should have been clearly pointed out. It is not known why the exact dates of completion of the first 12 "10,000-tonners" are given almost without mentioning (except for the ore and coal ship, "Soldek") the remaining production of shipyards in the past decade!

Completely erroneous is the information about the plan of Polish shipyards for 1961-1965, because the production of that period was given only as 580,000 deadweight tons while the plan stipulates 1,840,000 deadweight tons. It follows from a comparison of these figures that H. Baginski gave only the volume of planned deliveries for the Polish merchant and fishing fleet, completely ignoring export production, which is grossly misleading. No information is given here about the long-range plan of shipyards (to 1975), which the author mentions.

The conclusion of the book proper consists of a short essay entitled "Poland's Maritime Policy." An ambitious title, but the content is negligible. After general statements, such as "the main characteristic of Poland is her Baltic nature" (p 261), "Baltic nature--the foundation of the lasting existence of Polish state," (p 262), or absence of a decisive maritime policy as the cause of the weakening of and twice-repeated fall of the Polish state, it is said that maritime policy consists in (p 262-263):

"1) utilization of the access to the sea in order to develop maritime transport for direct commercial exchange with overseas countries; independence of foreign fleets through development of our own fleet; sale of our maritime services in the field of sea transport to other countries, particularly people's democracies (transit);

2) development of sea fishing in order, apart from animal breeding, to supply the population with protein, to obtain medicinal oil, fish flour, and other fish products, to become independent of their import and even, if possible, to export fish."

It is difficult to agree with such a formulation of the range and purposes of maritime policy. It does not include shipbuilding, only indirectly mentions ports (transit), and does not specify the further objectives of development of fleet and ports (foreign currency savings and revenues), etc.

Further misconceptions emerge on this background when a few lines further on we read that the trade policy should aim at distributing the total of shipments only between our own fleet and that of our contracting parties (?!), and also that the port policy, "in which the most important external problem is the struggle for the basic nature of our ports, and the internal one the efforts to provide them with the most modern equipment, efficient organization, careful service of cargo and ship." Not a word about the mutual relationship of trade and port policies and maritime policy.

The book is supplemented with an eight-page summary in English and a bibliography. Half of the summary is devoted to geographic and historical problems. As concerns the economic problems, the summary departs somewhat (sometimes to its advantage!) from the Polish text; it is also overloaded with details, often incorrectly formulated. For example, on page 271 it is said that the largest tramp ship of the PZM is the steamer "Wisla," with a carrying capacity of 5,125 deadweight tons, although on page 186 it is said that in 1958 the PZM received the ship "Chorzow" with 10,926 deadweight tons, which at the time was the largest ship of that ship owner. In addition, there is no reason to "boast" of the "Wisla" in the English summary, since it is an old ship (33 years), destined for scrap.

The bibliography is extremely extensive and includes about 600 items--that is, a number rarely encountered even in serious scientific works. Particularly extensive is the bibliography concerning historical works. However, it seems that the whole bibliography is overloaded, that it contains works not utilized at all in the book and even having nothing to do with it (e.g., the book about the theory of construction of port reloading installations, or about the chemical technology of bituminous coal!)

In addition, the book contains an index of about 900 names.

All this can be found in the reviewed book. I will not enumerate what it does not contain because the above (very incomplete!) list of its shortcomings and errors clearly shows this,. Particularly weak is Book Three, devoted to the contemporary Polish maritime economy. With the almost complete neglect of the problems of development (and underdevelopment) of the maritime economy of the interwar period, as well as reconstruction after the war, the reader is unable to understand many problems of the present situation in our maritime economy. Also, the actual state of the maritime economy is presented superficially--for example, there is an absence of more precise characteristics of the merchant and fishing fleet, shipbuilding, etc. A cardinal error is the neglect of the international problems of shipping, ports, and shipyards connected with our maritime economy and the failure to present our position in the world maritime economy.

Despite the historical inclinations of the author, the book is to a large extent not historical. Particularly improper is the constant comparison of interwar indices with the present situation, which is seriously misleading because to a large extent the phenomena are not comparable. For example, on page 67 the author maintains that "the attainment of a 77.7-percent sea turnover in tonnage and 63 percent in value--an average of about 75 percent of the total turnover of foreign trade--confirms the historical truth that Poland is permanently tied with the Baltic." Many words--but the figures apply to the prewar period. On page 168 the author himself points out that the present share of the sea turnover in Polish foreign trade is only 30 percent and, on page 178, that the turnover of our foreign trade by sea shows a falling tendency (not true!); this of course does not mean that Poland is no longer a maritime

country, but why these arguments with the aid of obsolete figures?

The character of the book and the way it is written also gives rise to serious reservations. This applies [especially] to Book Three, which was treated in a very journalistic manner, in this form completely unsuitable for book publication. This is evident from a large amount of no longer timely information, the declarative and postulative nature of many statements (often no longer timely), the non-exhaustive treatment of the subject, etc., as well as numerous errors.

Another shortcoming of the book seems to be the intermixture of descriptions and historical and economic analyses with explanations of technical, technological, and organizational type. This gives the impression of an encyclopedia.

It seems that one of the basic causes of so many shortcomings and errors in the discussed book is the fact that it was not specially written but "prepared anew" on the basis of the previous edition. It is a pity that this was done by an experienced author, who had written the first book on this subject in 1927, and a second enlarged edition of it published in England in 1942 (in Polish and in English), and who also wrote another work on maritime problems, Poland's Freedom at Sea, published twice in Polish and four times in English, and has very important achievements to his credit in the field of supporting Polish maritime thought and Polish rights on the Baltic.

On the other hand, the newly written sections of the book, concerning first of all contemporary Polish maritime policy, are based mostly on other Polish publications, primarily various periodicals, but unfortunately they have not been brought up to date, and properly utilized.

Much responsibility falls to the publisher, who did not provide the book with good editorial, specialist, or even formal service. It is not known whether an opinion was issued on the book or by whom, for no names are given by the publisher. However, the publishing editors are also to be blamed for not noticing the cardinal errors in composition and content, the inconsistencies, obsolete information, etc. A separate review could be written about the terms and names used in the book and its graphic preparation.

It is with regret that such sharp accusations have to be addressed to one of our leading publishers, and at the same time it can be stated with full conviction (and satisfaction) that in its present form the discussed book would never see the light of day if it were published by our only publishing enterprise in the maritime field--that is, by the Maritime Publishing Enterprise ("Wydawnictwo Morskie") in Gdynia. Why was this task not entrusted to it?

In summing up, it can be stated that the aim of the author--acquainting the general reading public with the total of the Polish maritime problems--has not been properly achieved. Polish readers continue to wait for a correct popular scientific book on this subject, for an elementary maritime textbook which would deepen their knowledge of maritime affairs which are still unfamiliar to our society.

On the background of the above characteristics of the book and its errors, one is surprised at its evaluation by numerous reviewers. It can be stated without exaggeration that among the maritime books published after the war none have had so many reviews and notices, and very favorable ones. The book was reviewed by the daily press (on the coast and in Warsaw), in illustrated weeklies and social and cultural periodicals. More serious reservations were voiced only by the reviewer of Tygodnik Morski (No 45, of 8 November 1959) who expressed doubt about the need for a new edition of this book and noted its obsolescence. A second critical review also appeared there (No 51, 1959).

However, the reservations of other reviewers are limited to pointing out such shortcomings as the failure to discuss marine problem or problems of sea resorts. At the same time, some reviewers from whom one could expect a more critical attitude toward the book, repeat some of the author's erroneous statements. Does this fulfill the responsibility of reviewers for the written word?

## POLAND

### Three Years of Operation of the Fleet Development Fund

[This is a translation of an unsigned article in Technika i Gospodarka Morska, Vol IX, No 12, December 1959, Gdynia, page 397; CSO: 3618-N/5]

The Council of Ministers (Rada Ministrow), by Resolution No 804/56 of 22 December 1956, created and determined the principles of financing the Fleet Development Fund [FRE] (Fundus Rozbudowy Morskiej Floty Handlowej). Thus, the third year of operation of the FRF is passing and it is worth while to sum up the results of its work.

In accordance with the Resolution of the Parliament of Poland of 12 July 1957 concerning the Five-Year Plan for Economic Development (Piecioletni Plan Rozwoju Gospodarczego) the tasks of the FRF were defined by the allocation for purchases of imported ships up to about 120,000 deadweight tons by the end of the past Five-Year Plan in order to supplement the tonnage of the Polish merchant fleet. The implementation of this task in 1957-1959 was as follows:

#### 1957 deadweight tons

- |  |        |
|--|--------|
| 1) Purchase of tanker "Kasprowy"   | 13,410 |
| 2) Order from Pula (Yugoslavia) shipyard of two tankers of 20,250 deadweight tons; one was built and accepted in 1959 as the "Karpaty" | 20,250 |
| 3) The other will be delivered in 1960   | 20,250 |

#### 1958

- |   |        |
|---|--------|
| 1) Purchase of tanker "Ornak" (in place of the scrapped tanker "Karpaty") | 13,100 |
|---|--------|

#### 1959

- |   |       |
|---|-------|
| 5) Order in Helsingor (Denmark) of general carrier "Sienkiewicz" with delivery in December 1959 | 8,500 |
|---|-------|



1959

deadweight tons

6-8) Order of three general carriers from Rijeka (Yugoslavia) shipyard with a carrying capacity of 8,530 each with delivery: first in March 1961, second in June 1961, third in September 1961

25,890

Total: Eight ships with carrying capacity

101,500

Out of the above total, the deliveries realized by the end of 1959 are as follows:

Ships	Gross Register Tons	Net Register Tons	Dead-weight Tons	Operating Speed
M. T. "Kasprowy"	8,528	5,060	13,510	13
M. T. "Karpaty"	13,479	8,643	20,250	16
M. T. "Ornak"	8,207	4,805	13,100	13
M. S. "Sienkiewicz"	5,900	3,800	8,500	17
Total 1956-1959	36,114	22,308	55,360	-

In addition, the FRF helped to finance the purchase of the ship "Liwiec" for the PZM [Polska Zegluga Morska; Polish Ocean Shipping] to the amount of 48,000 pounds sterling.

Apart from the purchases and orders for ships given above, the FRF also joined in the purchase of ships within the so-called "anti-charter program." The FRF has shown that in view of the considerable drop in second hand ships, particularly the "Liberty" and Empire" type, it is cheaper in terms of foreign currency to purchase the ship and operate it than to charter foreign ships or to pay freight for Polish cargo shipped on foreign ships. In this program the FRF purchased two ships:

Ships	Gross Register Tons	Net Register Tons	Dead-Weight Tons	Operational Speed
M. T. "Zawrat"	8,454	4,947	12,730	13
S.S. "Chorzow" ("Liberty" type)	7,239	4,338	10,926	10
Total	15,693	9,285	23,656	



The value of tonnage purchased and ordered abroad with the date of delivery in 1957-1961 was as follows (in 1,000 dollars):

8 Ships for the PMH [Polska Marynarka Handlowa; Polish Merchant Marine]	25,491
2 ships from anti-charter program	1,256
Aid in financing M. S. "Liwiec"	134
Total	26,881

The difference between the value of orders and revenues to the amount of 16,625,000 dollars will be more than covered by payments to the fund in 1960-1961.

As follows from the brief summation of the results of activities during the three years of existence of the Fleet Development Fund, the results achieved generally correspond to the basic assumptions of the resolution on the fund and have contributed to a certain extent to the development of Polish tonnage and to covering the transport needs of our foreign trade.

POLAND

Scope and Basic Principles of the General  
Inventory of Capital Assets

[This is a translation of an article by Andrzej Junak and Aleksander Paszynski in Wiadomosci Statystyczne, Vol IV, No 4, July-August 1959, Warsaw, pages 1-8; CSO: 3637-N/a]

Matters relative to this subject require certain preliminary explanations of a historical nature. The present scope of the general inventory results from a specific situation and experiences during a nearly eight-year history of preparation for this undertaking.

The problem of conducting a general inventory arose in 1951. The first plans called for such an inventory throughout the socialized economy on a very broad scale. The purpose of the inventory planned at that time was to obtain data indispensable for improving the management of the national economy. For these reasons, the initiator of the undertaking, the PKPG [Panstwowa Komisja Planowania Gospodarczego; State Commission for Economic Planning], placed the main stress on obtaining detailed data on the state and structure--quantitative and qualitative--of the capital assets, and several technical and economic indices characterizing the individual branches of the national economy, the potential productive capacity, etc. However, the other side of the inventory--setting in order the management of capital assets from the point of view of the user (the enterprise) was not the immediate goal.

The planned scope of the inventory required such a considerable outlay in labor and costs that it made the final decision difficult. Attempts were made to find a way out of the difficulty by dividing the inventory into stages--that is, by conducting a full-scale inventory of buildings, constructions, machines, etc. But this was not practical for enterprises because staggering an inventory over a period of several years in an active enterprise results in lack of uniformity in findings and incomparability of results.

## The Subjective and Objective Scope of Action

Only in the last resolution of the Council of Ministers<sup>1</sup> (Rada Ministrow) were the discussed difficulties finally solved. The starting point of the decisions concerning the subjective and objective scope accepted in the resolution are the needs of the enterprise. In view of the impossibility of inventorying the entire socialist economy and the necessity of staggering the inventory tasks, the resolution provides for its being conducted first in all enterprises operating on the principles of economic accounting. The idea of such an inventory is to conduct in each enterprise a simultaneous inventory of all the capital assets. For this reason the division into stages concerns not specific groups of assets but specific enterprises.

In the first and present stage, the general inventory of capital assets is conducted by--state enterprises operating according to the principles of economic accounting and obliged to make depreciation deductions, as well as, enterprises in which the state share amounts to at least 50 percent and cooperative enterprises.

In consequence, it is to be expected that the inventory of capital assets in the possession of the remaining enterprises and organizations will be conducted in the second stage of the general inventory, which will be done after the complete termination and summingup of the work scheduled for the first stage.

At the same time, the government resolution provides for certain possibilities of rescheduling the inventory in certain enterprises. These provisions have the objective of ensuring an all-embracing inventory in specific branches or fields of the economy. If identical enterprises differing only in the form of financing or principles of accounting operate in a given branch or organizational set-up, it would not be proper to inventory only a part of the enterprises of this branch. If the majority of enterprises of the given branch operate according to the principles of economic accounting, it will of course be proper to broaden the scope of the first stage to include the remaining enterprises operating on different principles of financing. In a contrary situation, nothing prevents the exclusion of a certain number of enterprises from the inventory. In other words, it does not seem desirable to organize the whole executive apparatus to prepare the inventory in a small

number of enterprises if the majority of the units in this branch will be subject to inventory only in the future. Giving up the inventory in these enterprises at present does not mean that it will not be made at all; the inventory tasks are simply postponed. The initiative to broaden or curtail the first stage of the inventory must originate from the superior units.

In such a way the Central Inventory Commission (Centralna Komisja Inwentaryzacyjna) approved the motions of the Ministry of Communal Economy (Ministerstwo Gospodarki Komunalnej) which aimed to broaden the scope of the inventory to all the communal enterprises regardless of their form of financing.

On the basis of the decision of the Central Inventory Commission, a general inventory of capital assets is also to be conducted by:

[a] industrial unions mentioned in Resolution No 392 of the Council of Ministers of 13 October 1958 concerning distribution of profit; equalization differences; covering of losses; financing of working capital, investments, and capital repairs in industrial enterprises; and the principles of financial management of industrial unions for 1959 (Monitor Polski, no 88, item 491);

[b] auxiliary undertakings managed according to the principles of economic accounting;

[c] scientific research institutes and central laboratories subordinate to the economic ministries listed in Paragraph 31 of the quoted Resolution No 392 of the Council of Ministers.

A separate problem is the question of the inventory of capital assets in the possession of enterprises only partially obliged to conduct an inventory (e.g., budgetary units having separate departments operating on the principles of economic accounting). There is also the problem of capital assets purchased out of the funds of an enterprise for clubs, community halls, sport organizations, etc., operating with the enterprise but actually not administered by it.

The acceptance of a general principle of an all-inclusive approach to the inventory seems beyond doubt. It means that an enterprise obliged to conduct an inventory (operating

according to the principles of economic accounting) should include in it, all objects regardless of the form of management. However, when the enterprise has only some separate department on [economic] accounting, it seems desirable to give up the inventory of these objects, naturally provided the enterprise is not particularly interested in including them.

An explanation is also required by the scope of the general inventory or, more strictly speaking, the scope of findings required in the course of a general inventory for the individual groups of capital assets. Here the government resolution introduces certain limitations with relation to the original assumptions. These limitations concern first of all the scope of the data which will be summed up and treated as results of the general inventory.

As we said in the beginning, at first the planned scope of the inventory provided first of all for the collection of data necessary for the management of the national economy. At present stress has been placed on setting in order the management of capital assets in the enterprise, first of all through the introduction of their proper recording (classification, definition of the object), setting in order the foundations for the calculation of costs and depreciation (evaluation), and the determination of the technical state (degree of wear and remaining life-span). Of course this does not mean relinquishing the effects which the inventory will bring on the scale of the national economy.

In view of the disproportions between the needs and possibilities for effecting a summing up of the results of the inventory and preparing them on the basis of analytical publication tables, the problem was solved in the following way. The inventory charts--the basic inventory document--created as a result of the general inventory for all the buildings, constructions, machines, technical installations, and means of transport will contain a wide range of information about these objects, much exceeding the formal tasks of the inventory. The inventory charts and the record sheets created on their basis will in this way constitute a multilateral source of data, the basis for possible questionnaire studies. On the other hand, the collective computations of the results of the inventory (added up on all the organizational levels) will contain only the value data in several cross-sections, basic quantitative, and qualitative data.

The widest scope of the inventory work applies to buildings. This is connected with the necessity of collecting several data exceeding the scope of the general inventory but needed by the people's councils for setting up new records of the buildings (including buildings belonging to enterprises not supervised by the people's councils). In addition, in the course of the inventory of buildings and constructions, machines, technical installations, and means of transport, it is necessary to list them, classify them in the proper classification group of capital assets and give them a proper classification symbol, determine the degree of wear, the past and future life span, the replacement value, and in addition several data connected with their technical properties, productive capacities, etc.

The third group of capital assets, from the point of view of the scope of the inventory, consists of tools, instruments, movable objects, and equipment, and livestock (of course only that which is counted among capital assets). This group will only be listed in the inventory and its value will be treated in the results of the inventory in accordance with bookkeeping entries.

Finally, the last group consists of perennial plants and land improvement installation. With regard to this group, no practical findings are to be made and in the results of the inventory it will be treated according to bookkeeping values.

In conclusion, some problems connected with the objective scope of general inventory: In accordance with the decision of the government resolution, objects subject to the general inventory include all capital assets whose value, in accordance with the provision in force, should be entered in bookkeeping records in the "capital assets" account, even if the proper entry has not been made. Of course it should be understood that this applies to the principles in force on the critical day of the inventory--that is, on 31 December 1959. However, this principle could not be accepted without certain exceptions. Thus, subject to the general inventory are:

a) machines and installations included in the detailed GUS [Główny Urząd Statystyczny; Main Statistical Bureau] instructions--also in those cases where, according to the provisions in force, they are treated not as capital assets but as nondurable objects;

b) buildings and constructions uncompleted but in use (e.g., buildings in which finishing work still has to be done);

c) parts of major buildings or constructions which are in use (except such projects in which only individual floors are in use)--also in cases where they do not yet figure in bookkeeping as capital assets.

Subject to the general inventory are both active capital assets (that is, those which are used) and inactive capital assets (that is, suitable for use but unused), without regard to the cause (e. g., machines in reserve, in repair, having temporarily or for a long time no application, or those offered for sale). Not subject to inventory are machines and installations requiring assembly and still not assembled, but only if they originate from the producer or commercial organization and are not being transferred from one user to another.

Subject to the inventory are all capital assets possessed by enterprises obliged to conduct the inventory. This applies not only to capital assets constituting the property of the enterprise<sup>3</sup> but also to all the others regardless of the title of ownership. The procedure is clear with regard to objects constituting the property or remaining in permanent possession of the enterprise. However, projects leased from other enterprises also obliged to effect the inventory are entered in the inventory by the actual user, who sends the filled inventory chart to the owner, who includes the object in his inventory results. Objects leased from units not obliged to make the inventory (budgetary units, private persons, etc.) are also entered in the inventory by the user, who includes them in the inventory results in separate items --that is, not showing them as his property.

The above decision concerns objects leased in their entirety. Of course it has no application to objects leased in part. For example, a private building in which a state enterprise uses only part of the space is not subject to inventory.

Capital assets under repair in another enterprise are entered in the inventory by the unit which is their owner or user. On demand, the repairing unit is obliged to supply specific data on the technical state of the repaired capital assets.



Capital assets transferred by an enterprise to another enterprise before 31 December 1959 which are en route on 31 December 1959 are entered in the inventory by the enterprise receiving these capital assets. In these cases, the enterprise transferring the capital assets is obliged to send to the receiving enterprises a document containing all the data needed to include them in the results of the general inventory and state that they were taken from the capital assets of the transferring enterprise before 1 January 1960. This does not apply to machines and installations which are not treated as capital assets--for example, machines sent by producers or distributors.

\* \* \*

We will attempt--of course in a greatly simplified way--to present the basic methodological assumptions of the general inventory.<sup>4</sup> The first fundamental problem is undoubtedly the classification of capital assets.

### Classification of Capital Assets

The basic classification cross-section of capital assets used during the universal inventory is the so-called type classification. The type classification is a systematic list of capital assets. Correct classification of capital assets is very difficult in view of the considerable diversity of types, productivities, and constructions of these assets. The difficulties in preparing a correct classification are connected with a few basic problems.

The basic problem is the difficulties connected with ensuring completeness of classification (including in it all capital assets), resulting from the lack of a complete study before the general inventory concerning which types of assets may occur in the field. In addition, the determination of correct criteria on dividing individual sets of capital assets into individual levels of classification (characteristics facilitating the division of larger sets of these capital assets into smaller ones) made it necessary to find solutions which, by characterizing the classified capital assets from the point of view of various interesting



properties of these assets (and therefore facilitating, after the general inventory, various economic analyses), would at the same time be decisive from the point of view of determining the replacement value.

An essential problem was the consequences stemming from the accepted system of decimal classification, which, in view of the diversity of capital assets classified in individual sets, led in certain cases to making it impossible to classify them in the available ten categories on a given level of division and, in extreme cases, made it necessary to prolong the classification division. Type classification of capital assets prepared for the needs of the general inventory (and utilized in the "Uniform List of Goods" published by the Main Statistical Bureau) is the first attempt of this kind in Polish practice, in connection with which it is to be expected that some shortcomings may arise from the point of view of its completeness and correctness, particularly concerning the choice of criteria of the classification division.

The basic division of capital assets on the first level of type classification is as follows:

- Group 0 - Perennial plants and land improvement installations
- Group 1 - Buildings
- Group 2 - Construction
- Group 3 - Power machines and boilers
- Group 4 - Machines, installations, and apparatuses of general use
- Group 5 - Special branch machines, installations, and apparatuses
- Group 6 - Technical installations
- Group 7 - Means of transport
- Group 8 - Tools, instruments, movable objects, and equipment
- Group 9 - Livestock

In the preparation of the type classification of capital assets, the following assumptions were accepted:

1. The precision of classification (number of levels of division) is not uniform but depends on the nature of the individual sets of capital assets and needs for the purposes of analysis and concerning the determination of the replacement value of these assets.

2. The last level of division (in the class) consists not concrete objects defined by name but sets of homogeneous objects or very similar ones from the point of view of purpose, construction, and material, differing in principle only by size characteristics.

It should be explained that in these cases, where size characteristics which are subject to change as a result of wear or of classification in qualifying the objects in a specific set, the original (nominal) size of the above-mentioned characteristic (e.g., the nominal productivity of the object) should be taken into account.

3. In cases where division according to purpose is used in the classification, this means the technological or use purpose and not the user (branch). This principle ensures against classifying identical objects in different sets.

4. In certain sets of capital assets (e.g., in a group of buildings) the principle was accepted that the specific criterion of division must only and always be on a specific level of division. In the majority of cases it was not possible to maintain this principle consistently. Within the framework of a determined set and level of division, however, the principle of uniformity of the criterion of division was, of course, accepted, since any other procedure could lead to fundamental errors.

5. Within the framework of classification of objects, their elements are not and cannot be taken into account, even if in certain cases they constitute separate inventory objects (for example, in the classification of machines engines are not given separate entries despite the fact that in certain cases they are treated as separate objects).

6. "Other" sets occur in the classification only in cases where, on specific levels of division, classification is not completely exhaustive (an example of exhaustive classification is a division according to size characteristics containing a set facilitating the classification of all objects--that is, having in the names of the lowest magnitudes the words "and less" and in the largest the words "and more"). Classes called "other" are reserved for objects which it will not be possible to include in any of the fixed classes.

7. The purpose of the object, which constitutes the basic criterion of division in type classification, we understand to be the purpose for which the object was built, which determined its construction. If the purpose of the object was basically and irrevocably changed during its use (for example a housing building was permanently converted to office use by means of alterations), the object should be classified in accordance with its new purpose. However, in cases where the change in purpose (or rather in method of use) is of a temporary nature (in the example given above, alterations were not made) such an object should be classified in accordance with its original and proper purpose.

Type classification of capital assets in Groups 1 to 7 is included in detailed instructions prepared and issued by the GUS. For capital assets in Groups 0, 8, and 9, the classification division may, if necessary, be determined by the interested ministries, presidia of people's councils, or cooperative centers.

The principles according to which classification cross-sections of capital assets are to be made, outside of the above-discussed type classification--that is, according to fields and branches of the national economy, territorial distribution, organizational membership, etc.--are treated in Instruction No V of GUS concerning the filling out of inventory forms. Classification of capital assets according to these criteria will be based on principles used for other purposes.

### The Object of Inventory--the Unit of Study

One of the most essential methodological problems of general inventory of capital assets is a precise and uniform definition of the inventory object (unit of study). The general solution of this problem consists in the fact that objects considered as separate inventory objects are capital assets which meet the following conditions:

- a) being wholly in the possession of one inventory preparing unit;
- b) being completely differentiated in space or, in the case of contact or tie with other objects, possessing clearly definable limits;

- c) being able to perform independently (as a whole) specific production or service functions;
- d) in principle, not being parts or elements of another object.

We will discuss the problems of inventory objects by taking the example of machines and installations.

In defining an inventory object, the starting point is the assumption that machine or installation is a separate object--not an assembly of machines or installations constituting a certain technological or production chain. The problem requires special stress if only because in many enterprises there is a tendency--particularly in technical sections--to treat certain assemblies, even those consisting of heterogeneous objects but clearly connected with each other technologically, as a unit in the records. Such an attitude is justified by the statement that, from the production point of view, the removal of one of the elements of such an object renders its remaining elements useless. At this point it is necessary to repeat once more that from the point of view of the objectives of the inventory (evaluation, determination of the degree of wear, proper records, and particularly determination of bases for depreciation) such reasoning is unacceptable because we must always operate with the idea of an object with clearly defined characteristics and sizes. Cases of constructional ties between objects are an exception to this principle, of necessity--for example, in cases of aggregates or machines permanently connected by a common plate; in such cases separate treatment of these objects would infringe on their constructional solution.

Also included among machines and installations as inventory objects are certain additional elements treated as equipment. This applies particularly to foundations and carrying constructions under machines, apparatuses, and installations, but only if they do not constitute an element of the building or any kind of masonry (e.g., in the case of boilers), supports, or partitions; if they are connected with only one machine or installation; otherwise, they will constitute separate constructions or parts of an industrial building. In addition, included as part of the object is normal equipment purchased with the object and included in its price--that is, elements not constituting a constructional whole with the object but serving for its operation or maintenance and facilitating the execution of

more precise or additional operations, more convenient and complete utilization of the object, increasing its technical or operational efficiency.

On the other hand, the idea of the object does not, in principle, include additional equipment (so-called special) purchased separately in order to obtain additional and greater technical or operational efficiency (e.g., additional casts). Individual elements of special equipment, if they possess the characteristics of capital assets, should be treated as separate objects in Group 8 (tools, instruments, movable objects, and equipment). However, spare parts will not be included in the general inventory even if in bookkeeping records they are treated as a capital asset, except of course for spare parts treated as elements of equipment of a normal object.

The greatest difficulty may arise in deciding in what cases electric engines constitute elements of working machines or installations and in what cases they constitute separate objects. The general principle was accepted that an engine is an element of the working machine or installation if it is a constructional part of the machine or installation (e.g., built-in or collar engine) or are of special construction designed solely for propulsion of specific types of machines or installations.

On the other hand, an engine constitutes a separate inventory object if it does not meet one of the conditions given above, if it propels several machines or installations, and if it can be used, without disassembly, to propel other machines and installations.

The limits of machines and installations as inventory objects are determined by entry and exit points, by connections with the permanent electric installation line nearest to the given object, or by a branching point of the compressed air conductors nearest to the given object. In case of collective propulsion, the limit of the object is the belt wheel located on the propulsion shaft of the machine.

Of course, these general definitions cannot solve several particularly complicated cases, which may arise especially in technical installations, consisting of several changing elements (drilling installations, conveyors, etc). In these cases the determination of the equipment of

the object and its limits is of course more complicated. For this reason, every appendix to the instruction on inventory of machines and installation (Instruction No IV of the Main Statistical Bureau concerning classification; determination of the degree of wear; and evaluation of machines, technical installations, and means of transport) contains detailed definitions of the composition and limits of the inventory object in individual types of capital assets.

### Degree of Wear

The determination of the degree of wear may create the most practical complications as a result of the different conditions of work of similar objects in the various branches, different degree of precision requirements, different average age of machines in individual branches and, with it, different criteria of wear in these branches. This variety of conditions and criteria of evaluation may cause a situation in which the theoretical recommendations of inventory instructions prepared for all branches, and therefore not taking into account specific conditions, may turn out to be inadequate.

The general principles contained in the instructions provide that in determining the degree of wear of capital assets in general inventory, nonpermanent wear (wear which will be removed in future repairs) is not taken into account, and in addition, uniform irrevocable wear in time is assumed. In connection with the above, the degree of wear is determined, with few exceptions, by the time method according to the formula:

$$Sz = \frac{d}{d+p} \times 100$$

Where Sz = degree of wear in percent

d = past duration of use in years

p = remaining duration of use in years.

"Past duration of use" should be understood to mean the age of the object--that is, the number of years since it was placed for use and the date of the general inventory, and in cases where the object was previously in the possession of other users, the basic for calculation of its age



should be the beginning of use by the first user. The data of beginning of use should be determined on the basis of documents and in their absence on the basis of declarations of trustworthy witnesses or, as a last resort, on the basis of an estimate, taking into account such data as: the year of construction of the object, the year of construction of the plant if it is known that the object was installed at that time, and approximate year of construction of objects of this type.

"Remaining duration of use" should be understood to mean expected number of years during which the object will be used, assuming that the necessary (technically and economically justified) repairs will be carried out. The basis of the above estimate should be first of all an evaluation of the technical state of the object and of possibilities and desirability of future repairs. Of particularly great importance is the above evaluation in case of older objects or ones which were subject to breakdown or which operate under abnormal conditions having an essential influence on their duration of use. In addition, the instructions contain general data concerning the average period of use of individual sets of machines and installations under normal conditions of use. The given periods should in principle be the basis for an evaluation of the degree of wear of objects working under conditions not departing from normal (especially if their present duration of use is comparatively short in comparison with the general average usable period).

The data on the average duration periods correspond to the specific utilization of capital assets (work on one, two, or three shifts, or continuous work). In case the object operates on a different number of shifts, it is necessary--if in specific cases the instructions do not provide otherwise--to correct the total usable period, considering that with work on two or three shifts the period is shorter than with work on one shift (in the first case the coefficient is 0.7, and in the second 0.6).

But these attempts to make the methods of determination of the degree of wear more precise do not fully settle the problem. Nor is the problem settled by other directives, despite the fact that in certain cases, to facilitate estimates of the remaining usable period, the instructions contain detailed additional information and advice facilitating the determination of the remaining usable period. They point out the elements of the objects to which attention

should be attracted in evaluating the technical state, and instances are given where the object, having reached a specific age, can no longer be used or has a number of capital repairs limited in advance (e.g., one only).

An example may be recommendations concerning the determination of wear of rotating, uncoupled electrical machines (sub-group 33) which advise--we quote literally--"In case the past period of use exceeds 75 percent of the approximate total life span, the remaining period of use should be determined on the basis of an examination of the state of the machine. The remaining period of use determined on the basis of the examination should not exceed the maximum remaining period of use given in Tables 15, 16, and 17, possibly taking into account the coefficient from Table 18"; and above: "The periods of utilization of machines operating under difficult conditions (thus having shorter usable periods) should be determined by multiplying the magnitudes given in Tables 15, 16, and 17 by the coefficient given in Table 18."

With this it must be stressed that analogous or similar solutions are not at all exceptional. On the contrary, they are comparatively numerous because this problem simply cannot be solved in instructions of a nature generally in force throughout the country. Neither general nor precise instructions can take into account the particular conditions of different branches, especially those with old machines, under-invested. Thus, it seems necessary to postulate the preparation by individual ministries, or perhaps the publication by individual unions and administrations, of their own recommendations concerning the determination of the remaining usable period to facilitate this determination under specific conditions and taking into account the current situation and the future investment intentions of their enterprises, the existing modernization intentions--in a word, containing dispositions stemming from particular policy in this field. The degree of wear of machines and installations determined in such a way will then constitute a real element for setting in order the management of capital assets.

In concluding this part of the considerations, it is worth adding that in certain cases the instructions recommend the determination of the degree of wear by a method other than time method. These are instances for which there exist certain technical norms for checking the degree of wear--for example, in the case of precision machine tools--



or instances in which physical wear is of completely irreversible nature and constitutes a mark of wear--for example, wear of the head of a rail.

In certain cases the degree of wear and the remaining usable period of the whole object is not determined at all. This applies particularly to complex objects (e.g., stationary refrigeration installations) consisting of several elements with varying usable periods and subject to replacement during periodic repairs. In special cases the instructions define the duty of determining the degree of wear, not of the whole object but only of its basic elements. In these cases too, the above given recommendations have full application.

### Replacement Value

The replacement value of capital assets is the sum of the outlays which would have to be made in connection with the reproduction of the possessed capital assets in a new state, under actual conditions. In practice the technical obsolescence (that is, moral wear) of possessed capital assets is taken into account because, according to Polish solutions in the case of an obsolete object the accepted replacement value is the cost of construction or purchase not of an identical object but of one constructed according to current standards or an available object for the same purpose, of the same productive capacity, and of the most similar construction among contemporary constructions.

The general solutions concerning the determination of replacement value of capital assets during the general inventory in Poland are as follows:

1. The value of replacement of buildings, constructions, and technical installations of construction and assembly nature corresponds to the cost of construction of an object with design, equipment, etc. identical or similar to the design and equipment of the evaluated object, determined on the basis of unit prices, wage rates, and construction and cost estimate rates, in force as of 1 January 1956.

2. The replacement value of machines, apparatuses, technical installations (except for installations of construction

and assembly nature), and means of transport is the 1 January 1956 price in a new state of an available object identical to the one evaluated or an object with the same purpose and productive (service) capacity and the most similar design, plus the cost of delivery, assembling, foundations, and carrying constructions, current on 1 January 1956, if these costs are applicable.

3. Also subject to evaluation are objects constructed, purchased, or produced within the enterprise after 1 January 1956. This solution was accepted to obtain uniformity of evaluation of all the capital assets.

Detailed GUS instructions contain recommendations indispensable for evaluating individual sets of capital assets, prepared on the basis of prices, wage rates, and cost estimate norms as of 1 January 1956.

\* \* \*

The period of preparatory work for the general inventory, embracing the preparation and publication of instruction materials and leaflets and the training of employees who will conduct the general inventory, is already completed. Among the tasks of ministries and wojewodztwo people's councils were, among other things:

- [1] the creation of inventory commissions;
- [2] the preparation of executive directives regulating the detailed course of the general inventory in units subordinate to the given ministry of the Presidium of WRN [Wojewodzka Rada Narodowa; Wojewodztwo People's Council];
- [3] the preparation of a list of enterprises covered by the general inventory;
- [4] the preparation of requests for the necessary quantities of instructions and leaflets;
- [5] the organization of training of inventory commissions of unions and some other units over enterprises;
- [6] the conducting of experimental inventories in selected enterprises.

The most urgent initial tasks of the enterprises, which must be realized immediately after the creation of the inventory commissions, are problems connected with ensuring

the necessary conditions for facilitating the inventory work in all stages. Of basic importance is the setting in order and supplementing of documentation of capital assets, consisting first of all in:

- [1] checking on whether the individual capital assets are entered in bookkeeping records in separate items;
- [2] removal of possible backlogs in elimination from the "capital assets" account of liquidated objects and entry in that account of newly acquired objects;
- [3] liquidation and removal from records of those capital assets which have actually been withdrawn from use and are destined for liquidation but still appear in the account of capital assets;
- [4] control and supplementation of technical documentation of individual objects (passports, machine charts, etc.);
- [5] setting up obligatory technical documentation for objects which so far do not possess it and, if this is impossible, preparation by the organizational units exercising technical supervision over operations of technical characteristics of these objects, at least as concerns data needed for the general inventory;
- [6] supplementing of plans and position drawings, particularly for underground buildings and constructions (installations) and supplementing other material characterizing the distribution of inventory objects.

A separate, extremely important problem is the determination, in the course of preparatory work, of the legal status of the capital assets possessed by enterprises. In view of the fact that in the inventory results this criterion will be taken into account too, it is necessary to determine in advance:

- [1] which capital assets in the possession of the inventory preparing unit are in its permanent possession or constitute its incontestible property;
- [2] which capital assets are leased or temporarily used by the inventory preparing unit, and who is their formal owner or permanent possessor;
- [3] which capital assets in the possession of the inventory preparing unit have no determined title of ownership;
- [4] which capital assets constituting the property of the inventory preparing unit were leased or given for temporary use to other units;

[5] which capital units constituting the property of the inventory preparing unit were transferred to other units for repair or remain en route (and will not be returned by the time the inventory is made).

The next stage to be executed in October and November 1959 constitutes work preceding the actual inventory. These are the tasks of determining the quality and punctuality of the general inventory. For this reason, a maximum organizational effort should be exerted to cope with the work preparatory to the general inventory. In particular, it is necessary to make the ministerial and wojewodztwo commissions for general inventory more active in the direction of developing organizational and preparatory work in enterprises. Created for this purpose is the apparatus ensuring the organization of the course of the inventory and its control.

During that period the enterprises should complete all the supplementation of documentation and bookkeeping and technical records of capital assets, determine their legal status, and speed up the liquidation of capital assets withdrawn from use. In addition, the enterprises should effect a division into census regions and fields, determine the final number, composition, and tasks of the individual census groups, and train their members so as to enable the census groups, immediately after the completion of the preparatory work, to start direct work on the census of capital assets.

Enterprises have been given instructions and price lists concerning the inventory of buildings and constructions and, of course, the indispensable inventory charts for these objects and the remaining materials. The most important matter is the inventory of buildings and constructions because these groups of capital assets are the most difficult to enter in the inventory and, in addition, it is most convenient to do this in favorable weather conditions. Thus, all the conditions and possibilities for starting the inventory of buildings and constructions exist. If this stage of work is successfully completed, it is to be expected that the following stages will proceed smoothly.

Inventory work in inventory units should be completed by 31 May 1960. The preparation of collective computations in ministries and presidia of wojewodztwo people's councils and in cooperative centers and unions will be completed by

1 September 1960. The president of the Main Statistical Bureau is obliged by the decisions of the quoted Resolution No 12 of the Council of Ministers to present the general results of the inventory by 31 December 1960.

The general inventory is a program of very great importance for the national economy. Its dimensions (according to estimated data it will cover about 40,000 inventory units and about 300,000 persons will participate in the program) and scope of work equal, in our opinion, that of the general population censuses and the difficulties in carrying it out, because, unlike the general censuses which already have some tradition, trained cadres, and tested organizational forms and methods, the general inventory is a program attempted in Poland for the first time and our targets are not backed by experience, which fact of course influenced the method of its preparation and must be taken into account in our further moves. For this reason, all efforts should be made by all the persons conducting this program and all teams of individual enterprises to realize fully its significance and objective.

#### Footnotes

<sup>1</sup>Resolution No 12 of the Council of Ministers of 5 January 1959 on conducting a general inventory of capital assets (Monitor Polski, No 6, Item 24)

<sup>2</sup>The thesis of the division of the general inventory into two stages and the necessity of covering in the second stage organizational units not at present obliged to conduct it is an expression of the personal views of the authors. The above-mentioned Resolution No 12 of the Council of Ministers gives no suggestions on this matter (author's note).

<sup>3</sup>By the term "capital assets constituting the property of the enterprise," in the case of state enterprises, we mean capital assets in the permanent possession of these enterprises.

<sup>4</sup>These problems are discussed at greater length in the work of A. Junak and A. Paszynski, Zasady przeprowadzenia powszechnej inwentaryzacji srodkow trwalych, Cooperative Publication Enterprise (Zadlady Wydawnictw Spoldzielczych), Warsaw 1959, p 172

POLAND

Method of Balancing Monthly Indices of Industrial  
Production

[This is a translation of an article by Jan iszkowski  
in Wiadomosci Statystyczne, Vol IV, No 4, July/  
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In discussing the balancing of indices of industrial production, I have in mind an operation aiming to eliminate the influence which differences in the lengths of the monthly reporting periods exert on several indices of production.

The use of the term "balancing of indices" for operations of this kind may lead to misunderstandings because we also speak of balancing sequences when we intend to eliminate seasonal variations or irregular variations. Nevertheless, the term "balanced index" in the sense under discussion is encountered in textbooks of industrial statistics and in GUS [Główny Urząd Statystyczny; Main Statistical Bureau] publications.

In the Rocznik Statystyczny 1959 [Statistical Yearbook 1959] balanced indices are given for the first time since the war, not only for the whole industry but also for individual branches of industry.

The GUS publications give the balanced indices of total production of industry on the base: average month 1955 = 100.

Balanced indices of production are also calculated in planning and in analyzing economic activities whenever it is necessary to eliminate the influence of an unequal length of the compared periods over the formation of the index of labor productivity measured as the value of gross production, per employee or per worker of the industrial group. In comparing the output of products measured in natural units, the average daily or shift production individual months is calculated, which also amounts to balancing the sequences of production.

It is essential to balance monthly indices of industrial production in order to analyze them and also to analyze the

index of labor productivity. Despite the fact that the desirability of balancing the indices of monthly industrial production is obvious, little attention has so far been devoted to the problem of balancing the sequences of these indices, so much so that opinions on an increase or drop in labor productivity are voiced without taking into account the differences in the lengths of the reporting periods.

It also has to be realized that the accepted method of balancing monthly indices of production should depend on the system of production used in the given enterprise or the given branch of industry. Thus, with continuous operation when productive facilities are active uninterruptedly, and also on holidays, the basis of balancing will be the number of calendar days; in other cases the basis will be the number of working days in a month. Further, it would be desirable to take into account in the method of calculation such factors as shifts, shortening of the time of work, or interruptions, which influence the utilization of the calendar time of production.

In practice, in balancing monthly indices of production serious difficulties are encountered. Several statistical reports and studies concerning the dynamics of industrial production avoid the problem of inequality of reporting periods by not comparing directly the level of production of subsequent months but by using comparisons of analogous months, analogous quarters, or analogous periods calculated accumulatively from the beginning of the year in two succeeding years. However, this method also fails to provide an exact comparison, because in succeeding years there occur a different number of working days and even calendar days (leap years), and also changes occur in the scope of application of continuous operation or in shifts in industry.

In many countries, including Poland, statistical bureaus publish balanced indices, in the calculation of which the unequal number of working days in the individual months have generally been taken into account. Certain countries do not publish any balanced monthly indices of production, probably because of the difficulties connected with the method of calculation. With the method of [counting] working days, the real indices of production are multiplied by the balancing coefficient, which is the reverse of the ratio of the number of working days in the given month to the average number of working days of the months in 1955 (the number of working days in 1955 divided by 12). The



number of working days (T) in a month is calculated according to the formula:

$$T = \frac{(d \times 8) + (s \times 6)}{8}$$

d = the number of working days excluding Saturdays  
s = the number of Saturdays

Thus, a 46-hour work week is accepted (shorter working time on Saturdays).

As is evident from the above example, the method of working days is simple, but nevertheless it is not quite correct because it improperly assumes that all plants are closed on Sundays and holidays. In reality, the majority of industrial enterprises are closed on Sundays and holidays, but in certain branches of industry--for example in metallurgy, the chemical industry, the construction materials industry, the sugar industry (during the campaign), and others many of the plants use continuous operation. Also in certain seasonal industries considerable differences in shifts occur in the individual months. A plant normally operating on one shift switches even to three-shift production, in effect working up to three times as long during a month.

From the criticism of the presented method stemmed the postulate that, in order to balance the indices of production, information on the length of working time should be used--that is, the number of man-hours worked on an average by one worker in a month. Further in the course of this article we will consider whether this concept or other concepts based on working time records can give a correct method of balancing monthly indices of production and how it is possible in practice to solve the problem of balancing indices without introducing new elements into the records of the enterprises.

In accordance with the suggestion of utilizing information on working time, I calculated balanced indices for the months of the fourth quarter of 1958 concerning socialized industry, accepting various bases of balancing taken from the statistics of employment and working time. In comparison with the real index and an index balanced with the aid of the present method of working days, these indices are presented in Table 1.

Table 1

Indicators	No.	1955	1 9 5 8		
		Average Month	Octo- ber	Novem- ber	Decem- ber
Real index of gross production 1		100.0	147.9	148.4	147.4
Balanced index:		x	100.0	100.2	99.8
Method of working days 2		100.0	138.2	156.8	149.5
		x	100.0	133.0	108.0
On the basis of average time 3		100.0	149.2	159.0	156.0
worked by one worker		x	100.0	106.5	104.2
On the basis of nominal time 4		100.0	154.0	174.0	166.5
of work per worker		x	100.0	113.0	108.0
On the basis of "production 5		100.0	137.2	153.0	150.0
time"		x	100.0	111.2	109.2
On the basis of the "average 6		100.0	133.8	149.2	148.1
production time" corrected by		x	100.0	111.4	99.3
the hours of continuous operation					
Method of working days and ca-7		100.0	140.5	155.8	149.1
lendar days, taking into ac-		x	100.0	110.1	106.1
count continuous operation					

The method of calculation and the content of the indices mentioned above require some explanation.

Index No 3, calculated on the basis of the average time worked by one worker, shows, as is evident, a much higher dynamics than the real index, which is a result of shortening the time of work. The behavior of index No 4, calculated on the basis of nominal working time, is similar. The dynamics of this index is stronger than that of index No 3, which results from an improvement in utilization of working time in the fourth quarter of 1958. These phenomena are evident in Table 2.

Table 2

Year	Average Number of Workers Em- ployed in the Industrial Gro- up in Thousands	Average Monthly Time Worked In Million Man- Hours	Nominal Man- al Group	Time of Work per Worker of Industri- al Group	Ratio of Worked to Nominal Time, in Percent	
1955	2,050.5	402	378	196	184	94
1956	2,161.7	428	392	197	181	92
1957	2,250.3	395	398	175	177	101
1958	2,274.6	402	407	178	179	100
fourth quarter of 1958	2,302.4	406	426	176	185	105

As we see, index No 4 (based on the nominal working time of one worker) differs from the currently calculated index No 3 in the fact that, using the calculation starting with the number of working days (excluding Saturdays) and the number of Saturdays, we assume a 46-hour working week (generally for all workers), while according to the reporting data we obtain average figures which are, of course, subject to seasonal variations and to serious changes over a longer period of time. In reality, with the level 1955 = 100, indices No 2 and No 4 clearly differ from each other, and with the base October 1958 = 100--that is, in a shorter period of time--they are identical.

As concerns index No 3, calculated on the basis of the time worked, it is subject in addition to the factor of utilization of nominal time of work, which naturally prevents the use of this kind of index in an analysis of productivity of labor.

I calculated index No 5 introducing "production time" for each month. By "production time" I mean the number of hours during which, on an average in the given month, the productive installations were active in the plants. We know that with one-shift operation the "production time" in principle corresponds to the nominal length of the working time per worker, with two shifts to its double length, and with continuous operation to the full extent of the calendar time (24 hours per day). Thus, I assumed that the "production time" in the given month equaled the nominal time of the work of workers multiplied by the coefficient of shifts.

In comparing index No 5 with index No 4 calculated on the basis of the nominal working time, and with the current index No 2, we observe that the influence of cutting the nominal working time over the balanced index of production was compensated for by the increase in the index of shifts. Nevertheless, the production time which we accepted as the basis for balancing the index of production does not fully take into account the influence exerted by continuous operation on the production time. The nominal working time per worker corresponds to the length of time on working days, but with continuous operation production also takes place on Sundays, and an additional two hours on Saturdays, which are considered as overtime hours and as such are not included in the nominal working time. In this connection it is known that with technical progress and progress in the field of utilization of production facilities, the share of continuous operation in general production increases, which fact will influence the actual production time. In certain branches of industry--for example, in the sugar industry--we also deal with continuous operation only in the campaign period and hence, among other reasons, the participation of continuous operation changes in the successive months.

In calculating the correction for the nominal production time because of continuous operation, it is possible to use, as the only data available, the information on the number of overtime man-hours resulting from continuous operation. With this we must take into account the number of Saturdays, Sundays, and holidays, because there were no holidays in the given month, the overtime hours resulting from continuous operation would constitute, in principle, only the additional two hours of work on Saturdays. It can be assumed that, for hours worked under continuous operations on Sundays, the workers receive a day off during the week, and for this reason Sunday hours are not overtime. In months in which there are holidays, overtime resulting from continuous operation is paid also for holidays (excluding Sundays).

With such an assumption I was able to calculate the additional time of production on Saturdays, Sundays, and holidays. Accepted for each Sunday was a number of hours four times as high as the number of overtime hours resulting from continuous operation and falling on each Saturday in the given month. Table 3 explains the method of calculation of index No 6.

Table 3

Indicators	Line	1955			1958		
		Year	Average	Month	October	November	December
Number of:							
Saturdays	1	52	x		4	4	4
Sundays (excluding holidays)	2	52	x		4	5	4
Holidays	3	8	x		-	1	2
Average employment of workers of the industrial group (1,000)	4	2,050.6	2,050.6		2,287.0	2,308.8	2,312.6
Man-hours worked (million hours)	5	4,537.0	378.2		439.7	415.2	422.3
Normal	6	4,253.3	354.3		374.9	349.9	356.8
Overtime stemming from continuous operation	7	68.7	5.8		6.1	8.2	7.5
Man-hours not worked and missed (million hours)	8	562.0	46.8		55.5	37.5	44.8
Coefficient of shifts* (in million hours)	9	1.55	1.55		1.74	1.76	1.72
Nominal working time of a worker (hours)**	10	x	196.0		188.0	167.7	173.6
Production time in hours (line 9 + line 10)	11	x	304		327	295	298
Hours which were paid as overtime in continuous operation (line 1 x 2) + (line 3 x 8)	12	168	x		8	16	24
Production time in one shift on Sunday (line 2 x 8)	13	416	x		32	40	32
Man-hours worked on an average by one worker in continuous operation during Satur-							

[table continued]

Indicators, etc.

day overtime hours, Sundays, and holidays***	14	116	9.8	13.3	12.1	7.6
Additional average production time on Saturdays, Sundays, and holidays calculated for three shifts (line 14 x 3)	15	x	29	40	36	23
Corrected production time (line 11 + line 15)	16	x	333	367	331	331
Real index of gross production	17	x	100.0	147.9	148.4	147.4
Index balanced by the correction production time line 17 x 333 line 16	18	x	100.0	133.8	149.2	148.1

\*General estimate data

\*\*(line 5 + line 8)

line 4

\*\*\*(line 12 + line 13) x line 7

line 12 x line 4

[units of measure for lines in above table]

Lines 1, 2, and 3 in days

Line 4 in thousands of persons

Lines 5, 6, 7, 8, and 9 in million hours

Lines 10, 11, 12, 13, 14, 15, and 16 in hours

Thus the calculated balanced index of production No 6 is based neither on nominal time nor on calendar time. This latter would be the case if production were executed 100 percent in continuous operation. In fact the (average) production time depends on the participation of continuous operation.

Despite the rather considerable labor involved in the calculation, balanced indices based on the production time derived do not take into account the essential factor of interruptions in production. Theoretically, it is possible to take into account various hours of interruptions, but

in continuing calculations on the basis of known interruption hours, I came to the conclusion that they consisted of playing with figures of little usefulness.

It is necessary to recall the main reservation which we made in the beginning against the currently used method of balancing indices--namely, that it does not take continuous operation into account. In aiming to simplify the presented method and at the same time to remove this main reservation we can assume that, having learned the participation of continuous operation, we will thus know what part of production should be balanced by the method of working days (the current ones) and for what part the method of calendar days should be used.

The share of continuous operation in production can be approximately defined as a percentage ratio of the number of man-hours worked in continuous operation to the total number of man-hours worked in the given month. The number of hours worked in continuous operation can be estimated on the basis of the formula:

$$H_c = \frac{t_n + t_c}{t_c} \times k_c$$

where  $t_n$  = nominal time of work of worker (number of working days excluding Saturdays  $\times 8$  + (number of Saturdays  $\times 6$ )  
 $t_c$  = number of hours which are paid as overtime hours resulting from continuous operation (number of Saturdays  $\times 2$ ) + (number of holidays, excluding Sundays,  $\times 8$ )  
 $h_c$  = number of overtime man-hours resulting from continuous operation

The calculation of the balanced index of production is based on the method of balancing coefficients:

- a) according to working days for non-continuous operation,
- b) according to calendar days for continuous operation.

Average coefficients are calculated using as weights the above introduced share of noncontinuous and continuous operation. In a specific example, the calculations are presented in Table 4.



Table 4

Indicators	Li- ne	1955	1 9 5 8		
		Average Month	October	November	December
Share of noncontinuous operation	1	77.1	76.0	75.4	84.0
Share of continuous operation	2	22.9	24.0	24.6	16.0
Balancing coefficients:					
For working days	3	1.000	0.936	1.060	1.018
For calendar days	4	1.000	0.980	1.012	0.980
Weighted average	5	1.000	0.952	1.049	1.012
Real index of gross production	6	100.0	147.9	148.4	147.4
Balanced index of gross production (line 4 x line 3)	7	100.0	140.5	155.8	149.1

It can easily be noticed that the method of Index No 6 and of index No 7 may give different results. These differences follow mostly from the difference in the method of estimating the share of continuous operation in the process of production. The problem of the share of continuous operation therefore constitutes a basic question in the problems of balancing monthly indices of production.

The share of continuous operation, defined on the basis of data of the working time, calculated by any method, does not of course correspond to the real ratio of the value of production produced in continuous operation to the total value of production, because the ratio of the value of production to production time is greatly varying in individual branches of industry. We would commit a lesser mistake if we determined the share of continuous operation separately for each branch of industry and if we introduced a general balanced index of total production as an average index, weighted by the share of the given branch of industry in the total value of production.

The layout of a collective working table for this kind of calculation can be suggested as given in Table 5.

Branches of Industry	January	February, etc.
a=value in millions zlotys	Average Weighted Value of Balancing Coef- ficient	Production Real Balanced January]
b=index, average mo- nth of 1955-100		[same head- ings as for

Total socialized in-  
dustry

a  
b

Production of elec-  
tric and thermal  
power

a  
b

Fuels and coke-  
mical industry

a  
b

etc.

Before preparing this table, it is of course necessary to calculate, separately for each branch, the share of continuous operation (in accordance with the formula given above), and then to derive the average balancing coefficients. After the necessary studies it will be possible to assume in certain branches a constant share of continuous operation and in others a variable share according to season. In this way it would be possible to speed up and simplify the calculations.

The difficulty of determining the share of continuous operation according to the branch of industry consists in the lack of proper records in the branch division. However, there is a possibility of estimating this share on the basis of current employment records of unions or ministries.

It should be realized that an exact balancing of monthly indices on the GUS level is impossible. For example, it is in practice not possible to eliminate the influence of interruptions, fluctuations in the scope of shifts, etc., which does not mean that the indices should not be balanced. Although, after analyzing the problem of choice of the proper method of balancing the monthly index of industrial production, it is possible and proper to use the simplest method, nevertheless it seems necessary to agree that balanced indices should in any case be prepared and published according to branches of industry.

In conclusion, I would like to point out the desirability of calculations balanced monthly indices of production, not only on the central level in GUS but also in enterprises, unions, ministries, and statistical departments of the presidia of people's councils--that is, in all institutions which analyze the productive activity or prepare statistical publications in this field.

As concerns enterprises, the calculation of a balanced index of production may involve several difficulties, although an enterprise having at its disposal exact records of working time is undoubtedly in a favorable position. The difficulties result from the fact that usually not all branches use continuous operation, and changes periodically take place in this respect. In addition, in the production process of the same products there are often production operations executed in continuous and noncontinuous operation. The ratio of the time of continuous production to the total time of production may not reflect the ratio of the value produced in continuous operation to the total value of production, especially since we analyze here the value of gross production--that is, including material costs--and not the value of net production. Hence it seems that the problem of methods of balancing indices of production of enterprises deserves a separate, detailed, and branch treatment, because for the purposes of the analysis of the activities of the enterprise, the indices must be calculated in a more precise way and the methods of estimate used on higher levels should rather not be recommended for enterprises.

## POLAND

### Buildings and Real Estate in the General Census

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The taking of a census of housing together with a general population census is a rather widespread phenomenon in international practice, but questions on buildings are included in the general population census forms in only a few countries. The collection of information on housing quarters together with the population census is facilitated by the fact that for organizational and technical reasons the apartment census sheet is often used. On this opportunity there is a possibility of asking questions concerning the apartment, its size, location, utilities, etc. Such questions illustrate the housing assets, living conditions, and housing needs of the population. The collection of information about buildings does not enjoy similar organizational conditions facilitating the taking of the census; on the contrary, it constitutes an added burden on it. But in view of the importance of this problem in the national economy and in view of the impossibility of obtaining information on buildings in another way, all our general censuses also covered the building problems.

At the present moment, on the basis of a Resolution of the Council of Ministers (Rada Ministrow) of 5 January 1959 (Monitor Polski, No 6, Item 24), there is under preparation a general inventory which will include capital assets (and buildings) possessed by state enterprises operating on the principles of economic accounting and by cooperative units. The Ministry of Communal Economy (Ministerstwo Gospodarki Komunalnej) provides the extension of the scope of the inventory to the remaining buildings. A full inventory of all housing buildings would facilitate the preparation of more detailed and precise statistics on buildings; then the population censuses would be relieved of the complicated building problems.

Nevertheless, Resolution No 425/58 of the Council of Ministers of 8 November 1958, concerning preparatory work

for the 1960 General Census, places on the Main Statistical Bureau (Główny Urząd Statystyczny) the duty of conducting a universal census of the population, apartments, buildings, and farms in December 1960. At the present moment the detailed scope of the census, as a discussion draft, was prepared by the Census Bureau (Biuro Spisowe) created at the Main Statistical Bureau. The draft will be discussed during meetings of the Programming Census Commission (Programowa Komisja Spisowa) and, as a result of discussion, may be subject to changes. In spite of this, we consider that it will be useful to acquaint interested persons and institutions with the building problems in the form in which they will be presented by the Census Bureau during the meeting of the Programming Census Commission.

### Definitions of a Building

First of all, we must deal with the concept of a building and discuss the meaning which was given to this term in the intended census. The census instruction does not define the word "building" and leaves the matter to the judgment of the census commissioner, but it defines the idea of separateness of a building.

The most natural way of determining the separateness of a building would be to use the criterion of technical separateness (just as we use the constructional criterion of separateness of an apartment). With such a treatment, not only detached buildings (separated from each other by free space) would be considered as separate buildings in any real estate area but, in the case of attached buildings, buildings divided by a wall without opening from foundation to roof. Such a definition permits us to see the buildings in their natural division into units each constituting a separate construction whole, and the definition seems simple and understandable, but in practical application it presents considerable difficulties. The difficulties consist in the necessity of investigating the construction of buildings; this requires some technical information which naturally cannot be possessed by the large number of census takers. Obtaining information on the existence and location of a dividing wall is often difficult and requires expert examination to see whether on any floor, in the cellar, or attic, there is no opening in the wall. The census taker

deceived by the external appearance of the house, can easily make errors in dividing a building complex into several separate buildings (e.g., back of the house and front), despite the fact that interconnections may exist between the apartments on some floor. Conversely, a row house built under the same roof may be considered by the census taker as one building, though it may be divided into separate constructions by dividing walls. Although in the 1931 census the accepted definition of a separate building was based on the construction whole, there are serious doubts about whether it can uniformly and properly be applied by the census commissioners; it can easily be expected that the difficulties of applying this definition could in many cases result in errors in the census material.

For this reason, in the draft for the 1960 census, as in the 1950 census, an abridged definition of the separateness of a building was accepted in the following formulation: "Any detached building--that is, separated from other buildings by free space--is to be considered as a separate building in the area of any given property. Buildings attached to each other are to be treated as separate only if they differ in wall material. Thus, if in the area of any given real estate there are attached buildings with the same wall material, they are to be treated as one building, even if they possess a different number of floors (different heights) or were built at different times."

As is evident from the above definition, in the case of buildings attached to each other, the [criterion of] construction whole--difficult to estimate--was given up, and the criterion of identical wall material construction--easier for the census taker--was accepted. Thus, if a complex of buildings in the area of a piece of property (e.g., front, back, and side buildings) is built of the same material, it will be treated as one and not several buildings, despite the fact that it may consist of separate construction wholes. Only when the adjoining building was constructed of a different material--for example, a wooden building adjoins a brick one--will it be counted as a separate building.

In the field the census taker will often encounter instances where adjoining buildings with the same wall material will be of different height (different number of floors) which is often the case with front and back houses. To achieve uniform treatment of such buildings by census takers,

it was necessary to supplement the definition by explaining that different height does not determine the separateness of the building and that if it is built of the same wall material it is to be considered as one building. However, instances may occur when the census taker, on his own judgment, will determine the separateness of buildings on the basis of their clearly different external characteristics--for example, adjoining a multi-story masonry building is a single-level masonry building, or a housing building adjoins an inhabited factory building with the same wall material but clearly a different construction and for a completely different purpose. It is proper that such buildings should be recorded separately. Since, however, there will be comparatively few such cases, they were not discussed in the instructions for the census takers because the definition of the separateness of the building would lose much of its clarity and thus could result in inaccuracy of information on standard buildings. Discussion of such exceptional cases is reserved for instructions for senior (regional) census takers.

Apart from the criterion of the construction of walls, which determines the separateness of buildings if they are attached to each other, in the new system of block construction of housing settlements a different influence will be exerted by the different practice of giving order (militia) numbers to real estate. The problem is that row buildings in such settlements--that is, buildings built under a common roof and having several staircases--sometimes have one common house number and sometimes the individual staircase entrances bear separate numbers. Thus, in the first case a row building will be considered as one building and in the second case it will be treated as several buildings--that is, according to the number of separate real estate units into which it was divided by granting separate house numbers to individual entrances (staircases).

In discussing the two methods of determining the separateness of buildings the criterion of "construction whole" and the criterion of "different material of wall construction," it is necessary to explain what differences [there will be] in the number of houses recorded and in what cases one or the other basis of defining a building will be used. The use of one or the other criterion of separateness of a building will have no influence in the case of small buildings because they have no dividing wall and are constructed



of one type of wall material. This will apply particularly to rural buildings, one-family buildings, and villa-type buildings in towns. The number of buildings obtained with this or the other assumption will be the same.

In two-family houses also, both criteria will basically give the same results. Although such buildings have a dividing wall and constitute two separate construction wholes, they usually belong to different owners; most often they are built along a street line and have separate entrances. (Usually they have different house numbers.) Although they are built of the same wall material and even architecturally constitute one whole, they will be treated as two separate buildings because they belong to two different pieces of property.

Neither shall we obtain major differences in the results in the case of multistory tenant buildings with several tenants. Usually they have no dividing wall, so that in both cases they would be counted as one building.

The differences emerge only in the case of large urban type buildings with attached front and back houses, and in the case of block construction of housing settlements. Here particularly, considerable differences will occur. Several separate building wholes will be counted as one building because the projects were built of the same wall material.

The differences in the number of buildings resulting from the application of different criteria of separateness have to be borne in mind when making comparisons based on two different principles [sic]. The number of small buildings containing a few apartments will be basically the same in both cases, but large buildings with scores of apartments, counted as one building using the criterion of wall material, would be divided into several smaller buildings constituting separate construction wholes. It can be expected that this division would not materially increase the number of small buildings but would be mostly limited to increasing the number of buildings with ten or more apartments.

The draft of the definition of a building in the 1960 census, as in 1950, based on the wall construction material and not on the construction whole, creates a certain artificial census unit. However, it has an economic and social justification:

a) It permits the separation of small housing buildings having only one room.

b) It makes it possible to study small, one- or two-family houses in which housing conditions differ considerably from conditions in large city dwellings.

c) It facilitates a division of actual buildings or a complex of homogeneous buildings and their housing resources from the point of view of the wall construction material--that is, a criterion determining the durability and fire resistance of buildings.

d) Finally, it permits a study of population distribution in buildings with various wall materials, which has some bearing on living standards.

#### The Main Purpose of Buildings

It should be stressed that the census will include only inhabited buildings--that is, buildings in which at least one person lives or occupies for living purposes during the census. It follows from this that factory, commercial, office, educational, cultural, and other buildings are not subject to the census if no one lives in them.

Among the inhabited buildings, of special interest in determining the characteristics of housing conditions is the group of buildings whose main purpose is housing. For this reason, the 1950 census contained a simple question: "Is the building primarily for housing? Enter yes or no." At present we suggest that the scope of this information be widened by introducing an additional question on the form: "If the building is primarily not for housing (but still inhabited), enter in addition its type (e.g., factory, office, school, student hostel, hospital, or other)." Such a formulation of the question does not have the objective of classifying nonhousing buildings according to their purpose (if only because we do not record uninhabited nonhousing buildings) but is to serve as a control question. In 1950, the brief negative answer of the accountant to this question, without an additional entry to explain the purpose of the building often created doubts. If the census taker defined the building as nonhousing and at the same time re-

corded a few apartments in it, it was not always possible to determine on the basis of other entries on the form whether the main purpose of the building was properly recorded by the census taker. The inclusion of additional information on the purpose of the building will also make it possible to eliminate inhabited out-buildings, like an inhabited cow shed, stable, garage, etc. This will facilitate a more complete study of temporarily inhabited quarters, which is an interesting problem from the point of view of evaluation of housing needs.

As was stressed, the main purpose of the question concerning the purpose of the building is to identify buildings whose main purpose is housing. Housing buildings will be the subject of a detailed study from the point of view of the material of wall construction and roof covering, number of floors, apartments, rooms, and inhabitants, and also from the point of view of their utilities: water supply, sewers, electricity, gas, and central heating.

We will consider as primarily a housing building a building of which all or at least half is used for ordinary apartments and the remaining part for other purposes (e.g. for school, office, factory, stores, etc.). It follows from such a treatment that for the classification of a building as a housing building both criteria are necessary--purpose and use. Thus, if a building designed for ordinary apartments has been used as a school, offices, etc., it will be classified as a nonhousing building even if a smaller part of it, in accordance with its purpose, is used for ordinary apartments (e.g., the apartment of the school director, etc.).

The determination of the primary purpose of the building in case of mixed use will often create certain difficulties for the accountants. Doubts will be created when more or less half of a building is used for ordinary housing and the other half for other purposes. In such a case the census provides for the primacy of housing buildings, instructing the commissioners that "if it is difficult to determine whether in fact the part used for apartments constitutes at least a half of the building, it is to be treated as a housing building."

A certain departure from the principle of the existence of both criteria--purpose and use--in determining the purpose of the building, was introduced with regard to housing

buildings already partly occupied and still under construction. Such buildings are classified solely according to purpose--that is, as housing buildings--even if during the census the building were used for housing only in a negligible degree (e.g., only the construction caretaker lived in it).

In the reconstruction of war destroyed villages, as a temporary measure to satisfy the immediate needs of the population, the "mixed" buildings were often constructed, and in certain parts of the country this type of construction is used normally in peasant farm buildings. In such buildings, under a common roof, one part is an ordinary living quarter and the other has space for a cow shed, barn, etc. In 1950 instances were detected of treatment of such housing-farm buildings by the census taker as temporarily inhabited buildings, which was contrary to the census intention. This required the preparation of additional post-census explanations and corrections. For this reason, in the 1960 census instructions it was explained that buildings of this kind should be recorded as housing buildings. A similar explanation was included in the instructions for housing buildings slated for demolition; in 1950 the census takers sometimes classified them as temporary buildings.

The census of buildings intended within the framework of the general 1960 census the primary purpose of deepening the studies on the housing conditions of that part of the population which lives in housing buildings and will serve for a more thorough characterization of the housing resources in those buildings.

As concerns the number of people living in collective households (student houses and hostels, dormitories, hotels, social service houses, etc.) and those living in temporarily inhabited quarters (inhabited stables, cow sheds, cellars, ruins, traveling carts, railroad cars, ships, barges, etc.), they will be counted mostly in the census of apartments, which is also a part of the general census. For this reason, in the 1960 census draft, answers to the questions describing the building from the point of view of wall construction material, roof covering, floors, and utilities are planned only with regard to buildings primarily used for housing.

## Wall Material and Roof Covering

One of the basic characteristics of a building from the point of view of durability and fire resistance is the material of which the walls and roof are made; at the same time it is an indication of the condition of dwellings and provides information on the population living in brick, wooden, clay, etc., houses.

The question concerning the wall material was included on the 1960 census form as follows: "Material of wall construction, such as reinforced concrete, concrete, brick, stone, Prussian masonry, lumber, clay, straw, or other, check one." The question on roofing is similar: "Material of roofing, such as metal plate, tile, tarpaper, shingles, straw, or other, check one." The questions require the census taker to enter the name of the material of which the walls or roof covering are made. The determination of the type of wall or roofing material often requires the qualifications of an expert, which the census taker will not possess, and sometimes it is impossible to determine on the basis of external appearance if the walls are plastered. For this reason, census takers are advised to obtain information from the owner of the building, manager, or tenants. The answers of census takers can be controlled by comparing them with answers to other questions on the form only to a very limited extent--for example, by correlation of the construction material with the number of floors.

Information obtained in 1950 on the wall material raised considerable doubts, and for this reason the result tables were divided buildings only into fireproof ones, specifying type of masonry, and not fireproof, specifying type of lumber. Among other things, doubts arose in the case of answers concerning reinforced concrete buildings (sometimes reinforced concrete was entered in the case of single story buildings), and in processing the material, difficulties arose as a result of listing two different materials and thus prevented proper classification.

In order to obtain more detailed information on the wall material, the rules were made correspondingly more rigid than in 1950 and the scope of examples on the census form was increased. In the "Instructions for census takers" it was clearly stressed that where two kinds of materials are used only one--the predominating wall material--is to be

entered, with the exception of a special type of construction called "Prussian masonry." In the examples listed at the head of the table on the census form, apart from "reinforced concrete," "concrete" was listed, and the term "masonry" was replaced by two examples: "brick" and "stone." Despite these changes and additional explanations in the instructions, one cannot be sure whether the 1960 census will provide enough detailed information to permit a more complete classification of buildings according to wall material than in 1950.

In connection with the above, doubts arise as to whether the request that the census taker enter the exact name of the material is a practical one. Perhaps better results would be achieved by authorizing the census takers to enter strictly defined classification groups, explaining in the instructions what kinds of materials should be classified in the individual groups. This would greatly facilitate the use of symbols and would avoid the difficulties sometimes resulting from the use by commissioners of local names of material. The problem of the formulation of the question on wall material should be discussed by the Programming Census Commission.

The question on the roofing material is comparatively easier. In general, the entries of census takers created no major doubts in 1950.

### The Number of Floors

The number of floors is one of the indices that determines the size of the building and the type of construction. This study is interesting, particularly in areas where the type of construction is varied. For this reason in the draft for the 1960 census this question was dropped for the rural areas, and the study of this phenomenon was restricted to towns and settlements only.

The number of floors also plays an indirect part as a control question facilitating in certain cases the determination of the correctness of the answer on wall construction material. We calculate the number of floors in a building according to the number of levels above the street level, not counting the street level and attics, garrets,



etc. The street level is the first one whose windows are above ground level (street). In buildings with basements, the street level will be the first level located over the basements. In case the individual parts of a building have various numbers of floors, the greater number is taken into account.

### Installations

As in 1950, the 1960 census form contains a question about facilities for water supply, sewers, electricity, gas and central heating. However, in comparison with 1950 the 1960 draft shows considerable differences:

- 1) Instead of examining the installations of the property, it is planned to examine the facilities of buildings (as in 1931).

- 2) In communes it is planned to ask about installation in the building for potable water (well or water supply) and electricity, ignoring the question about sewers, gas, and central heating.

The study of the building's facilities instead of the installation on the property gives a greater guarantee of obtaining more detailed information, primarily about local facilities. With a question about installations existing on the area of the property (in the 1950 census), census commissioners often included in local sewer system or local water supply quite primitive facilities in the form of back year toilets and manual pumps. It is to be expected that the question concerning installations inside the building will greatly lessen the danger of erroneous evaluation, though in this case too it will not be possible to eliminate completely incorrect answers distorting the picture; for example the classification of a sink inside the building [as connected with a] local sewer system despite the fact that the water is conducted to an open gutter. For the census taker the recording of such a building as not possessing a local sewer system often seems unjustifiable, since the apartment recorded by him possesses a sink.

The census provides for the division of installations into local and network ones only in the case of water supply and



sewers. In all types of installations, the principle is in force that only buildings which possess installations in any apartment or nonhousing premises, or only on the corridor, staircase, lobby, or cellar are to be considered as equipped with installations. Buildings not possessing inside installations will be classified as buildings without installations even if the installations are located on the external wall of the building with access only from the back yard.

This reservation has first of all the objective of eliminating from census material erroneous information about local sewers. Without these provision, it would be possible to classify among buildings equipped with installations a large number of buildings to which are attached primitively equipped toilets, often built of the same wall material and therefore, in accordance with the definition of the building, constituting one building. There may be instances where the toilet located on the external wall will even be connected with the sewer network, but even then the building will be considered as without sewer installations. It seems that from the point of view of the characteristics of housing conditions the problem of access to installations is more essential than the fact of connection with the sewer system. Not only a building equipped with toilets but also a building which does not possess a toilet but has an installation for the removal of used water (e.g., sink, bathroom, basin) in pipes to the sewer network or to a cesspool located on the property will be considered as buildings with sewer installations. The definition of a sewer network (general or local) does not differentiate between sewers into which only rainwater flows and sewers adapted for the removal of feces and other solid household and industrial refuse outside the town limits.

A building receiving light coke gas, natural, or other gas brought to the building in a network of pipes from the city, factory, or other gas works is considered as a building equipped with gas installation. However, a building is not considered as equipped with gas installation if the apartments used bottled gas. Central heating in a building is examined without specifying the type and source of heat. Steam and water installations, rib and ceiling ones, remote controlled, coming from cellar boilers, or floor ones will all be included.

The discussed installations will be listed only if they are operative or if they are temporarily in operative for not

longer than a year. Brief interruptions caused by repairs of the network or for other reasons will not prevent the classification of the building as possessing the given installation, but buildings in which the installation is permanently inoperative (e.g., as a result of destruction of gas works, even if the buildings had gas installation) will not be counted here.

The census of apartments, also carried out within the framework of the general census, will supply us with information on the population and number of apartments in which the installations are inside the apartment. However, the census of buildings will supplement this information, supplying data about the whole population and all apartments regardless of whether the installation is within the apartment, in the corridor, staircase, or lobby of the building. This will facilitate deeper studies of housing conditions of the population.

Only in towns and settlements will the equipment of housing buildings with sewers, electricity, gas, and central heating be studied. In the rural areas only the degree of electrification is to be studied and it is planned to examine the state of supplies of potable water. In view of the rare instances of piped water supplies in the rural areas, it is intended to ask a question concerning the existence in the area of the property of a well with potable water or of network of water pipes, or of local ones if located within the building.

#### Year of Construction

The draft 1960 census does not contain the question that was in the 1950 census concerning the year of construction of the building. It is beyond doubt that information on the age of the building is an important characteristic of the housing resources but obtaining data on the year of construction, even in broad age groups, gives rise to serious difficulties. The first difficulty is the fact that in towns often neither the managers nor the owners know the year of construction and can even approximately define the age of the building (in 1950 the question on the age of the building was often ignored). This applies particularly to the Western Territories, where in 1950 about 4 percent of the buildings in the towns had undetermined ages. Information obtained

from new tenants cannot always be fully trustworthy. In addition, it must be remembered that buildings are subject to numerous changes: reconstruction, superstructure, additional construction, complete reconstruction, or capital repairs. The scope of these changes differs, and so it would often be necessary to consider as the year of construction not the year of original construction but the year of reconstruction. There is no possibility of giving the census taker objective instructions on this matter so as to exclude a subjective and nonuniform approach that would lead to erroneous conclusions (this applies particularly to towns considerably affected by the hostilities).

It should be stressed that the determination of the age of the building alone does not give sufficient information on the age of housing resources because of the great differences in the sizes of buildings. Thus, it would be necessary to study the number of rooms in connection with the age of the buildings. Such a periodic study can, however, be applied only with regard to buildings newly built or completely reconstructed. For buildings partly reconstructed or having superstructures or additional constructions, etc., such a study would give a false picture because the rooms in such buildings may originate from different periods. For this reason it is proposed to give up the question on the age of construction of buildings.

### Population and Apartments

Apart from technical properties of buildings, the census building forms will also contain data concerning the number of inhabitants, apartments, and rooms in these buildings. This will make it possible to characterize housing buildings from the point of view of their size, and in connection with other characteristics of the building, such as, wall construction material, roofing, and installations, and will serve to deepen the studies on the housing conditions of the population.

## Real Estate

It is planned to include in the census real estate with constructions and inhabited projects which are not buildings. Included are cellars, chalets, ruins, traveling carts, railroad cars, ships, etc. In towns and settlements, these will be recorded on separate census sheets. In communes an examination of real estate will not be made because in the rural areas there are only few instances of real estate on which there are several buildings.

In principle, a separate real estate unit with construction means a lot with buildings constituting a separate object of ownership. The above legal definition of real estate, still has wide application to single-family houses or houses for a few families, but it loses this sense in housing settlements. For this reason it was necessary to recommend that in new block constructions every block (detached building) should be considered as a separate unit of real estate. If the individual entrances to this block received separate house (militia) numbers, each part of this block possessing a separate house number should be considered as a separate unit of real estate.

For the census of real estate with construction, only one question was included in the form concerning the administrator of the real estate--that is, the person or institution occupying the real estate for his or its own use or renting it to other persons, and in exchange bearing all the costs connected with the maintenance of the real estate in an usable state (maintenance of buildings, repairs, maintenance of order, etc.). Information on the number of inhabitants of real estate units remaining under the administration of people's councils, housing cooperatives, enterprises, or private owners are of great importance for the policy of management of housing resources.

In view of the importance of the information concerning the equipment of real estate with installations, and in order to obtain data comparable with that of the 1950 census, it is also planned in the 1960 census to study real estate according to equipment with installations. Although the census form does not contain a direct question on the equipment of the real estate with installations, we have a possibility of obtaining approximate information on this through the questions concerning buildings. This data will not be

complete because real estate with installations on the property and not connected with any of the census buildings will not be included. The differences resulting in the number of real estate units equipped with installations should not be too big. Local installations are usually set up in the building. There will probably be a few cases where the network installation located on the property is not utilized for connection with a housing building.

In conclusion, it is necessary to stress that the information on apartments and buildings is particularly valuable for analyzing the housing conditions in the location cross-section or for the purpose of housing management and policy conducted by the state authorities. For this reason, in the planned tables to be prepared concerning buildings and apartments, it is intended to list by name towns and settlements on a scale permitting the preparation of these tables at the time scheduled for the preparation of the census results.

POLAND

Measuring Labor Productivity

[This is a translation of an article by Jan Rosner in Wiadomosci Statystyczne, Vol IV, No 4, July/August 1959, Warsaw, pages 16-18: CSO: NY-3637-N/d]

The editors have already devoted much space to the problems of statistical studies on labor productivity in articles published in No 4, 1957, Nos 1, 2, 6, 1958, and No 1, 1959. The articles were of instructive value to those interested in the problem of labor productivity. In view of the considerable importance of this problem for the evaluation of the planned economic progress in 1959-1965, the editors appeal to the readers, suggesting that a discussion be started on the practical utilization of the methods of measuring labor productivity and that they send articles or remarks to the editors.

After the Second World War the problem of labor productivity became one of the details of interest to economic scientists because of the increased importance of labor productivity factors in the development of the economy of all countries. The methods of investigating the dynamics of labor productivity (of the given enterprise, the given branch of industry, or of individual countries) and inter-branch and international comparisons in this field are still a subject of research and discussion.

Apart from indices of production, employment, investments, or consumption, the indices of labor productivity are more and more often published and compared, as measures characterizing the degree of economic and social progress of the individual countries. The importance of this problem in Poland is evident from indices of the plan of economic development for 1959-1965, in which it is assumed that about 80 percent of the increase in industrial production in that period can be attained through an increase in labor productivity.

However, a closer analysis of the indices of labor productivity shows that this apparently simple idea is open to various interpretations. Even in countries in which economic and social statistics are considerably developed, like the USSR or the USA, the proper interpretation of indices of labor productivity and their proper processing encounter considerable methodological difficulties. We also experience these difficulties in Poland, where the postulate of the development of labor productivity statistics is the most timely necessity. Requirements in this field were formulated by Wladyslaw Gomułka in his report to the Twelfth Plenum of KC PZPR [Komitet Centralny Polskiej Zjednoczonej Partii Robotniczej; Central Committee of the Polish United Workers' Party] on 15 October 1958:

"It is necessary to conduct a systematic analysis of labor productivity and labor absorption of products in similar plants in the country and compare the results with those attained in leading plants abroad."

The realization of this indispensable postulate will, however, certainly encounter serious practical difficulties, in view of the imperfect statistical methods at our disposal in this field. The following remarks have the purpose of stressing certain problems connected with the difficulties of measuring productivity of labor.

### The Idea of Productivity of Labor

"The productivity of labor," states a well known Soviet economist, Prof Strumilin, "defines the quantity of the product--that is, the usable goods, in natural units, produced by a worker per unit of time."<sup>1</sup> This quantity is determined by several factors, some of which are connected with the person of the worker (subjective factors), and others constitute objective factors, independent of the will and personal characteristics of the worker. Subjective factors determining the individual productivity of the worker are, among other things, professional skills, intensity of work, and natural physical and psychological characteristics. On the other hand, the objective factors are defined by the term of "productive strength of labor," which is determined by the level of technology of the enterprise, rationality of organization of work, natural resources of the country and its climate, etc.



It follows from this listing alone that the dynamics of labor productivity are influenced by many factors. In evaluating the dynamics of labor productivity or in international comparisons in this field, stress is often placed on these or other factors, often the management of the enterprise, or its technical and engineering personnel, stresses the improvements of technology of production and of discipline, and an increase in the intensity of work; and the representatives of the workers stress the importance of increasing wages and improving working conditions as essential for increasing labor productivity. Despite the fact that the dynamics of labor productivity are influenced by all the above-listed objective and subjective factors, there can be no doubt that of the factors constantly intensifying influence are not so much those directly connected with "work" as with scientific progress and application of its results in industrial production (new sources of energy, improvement in the stocks of machines, mechanization and automation of production, better organization of work, etc.).

One of the basic factors influencing the productivity of labor is the working time of the workers. Without going into details in this extremely complicated problem, it can be stated that the universal tendency to shorten the working time of workers, which has been going on for about 100 years, results from the observation that in a modern industrial plant prolongation of the working day does not favor high productivity and increase in production. Increase in work and the resulting nervous tension and the more and more complicated and costly production apparatuses requiring very careful operation result in the fact that a correspondingly shorter working day becomes one of the factors favoring an increase in labor productivity.

Subjective factors, such as professional skills and intensity of work, play a very important part, especially in cases where the worker himself sets the pace of the process of production and has an individual influence over the quantity and quality of production. However, in operating aggregates, in conveyor belt production, and especially in automatic production, the skills and individual labor input of the worker are to a large extent transferred from the man to the machine, and the attained production results will more and more depend on the efficiency of the production apparatus.

## Measurement of Labor

The importance that has been attached, particularly in postwar years, to the problems of labor productivity led to research for the most proper methods of measuring labor and its productivity. Attention was also concentrated on this problem by the International Labor Organization. In 1949 the Seventh International Conference of Labor Statisticians<sup>2</sup> was held. One subject of discussion was, the problem of the methods of statistical study of labor productivity. The report for this conference prepared by the International Labor Office contains interesting data and an attempt to systematize this complicated problem<sup>3</sup>. In our further considerations we will use certain materials contained in this publication and also in the report on the work of the Conference.

An important problem connected with measuring labor productivity is the determination of the category of persons covered by the statistical study. As is well known, the very modest Polish labor productivity statistics cover "Manual workers of the industrial group"--that is, the personnel excluding technical and engineering, administrative, managerial, and auxiliary personnel. In Western statistics we often encounter a division of "direct labor" and "indirect labor." Thus, for example, the American labor productivity statistics include in direct labor employees working on production, and in indirect labor employees occupied with supervision, maintenance, handling of materials, forwarding and acceptance of goods, inspection, protection of the enterprise, control, etc.; completely excluded from the statistics are employees of general administration, offices, engineers, and commercial employees.

Despite the fact that in the statistics of the majority of countries there is a division into production employees (direct labor) and the remaining categories of employees, the definitions are various and, shifts during the year of certain groups of employees from one category to another distort the picture of dynamics of development of labor productivity.

A basic problem is the determination of the measure of labor productivity. The basic index is the ratio of the produced product in nature ( $p$ ) and the time of work used in the given period ( $t$ ). Production is measured either with

relation to the number of persons employed or worked. Both these indices have their justification and application: the ratio of production to employment may be used, for example, in determining the demand for manpower, in determining the employment opportunities, for the calculation of the future national income, etc. On the other hand, the ratio of production to man-hours (the index used in Poland) makes it possible to determine the changes in the volume of production as compared with the time devoted to effective work, the effective productive capacity of the labor force, or the cost of production expressed in labor units.

However, the ratio production: labor ( $p:t$ ) can also be reversed, determining what labor outlay is necessary per unit of production ( $t:p$ ). This index, in the American terminology called "unit labor requirement," determines the labor absorption in the given production process. In accordance with the ideas of Marxist economy, the quantity of labor incorporated in the unit of product is the measure of value of the given product. An increase in labor productivity thus measured will be expressed in terms of the time necessary to produce the given product--that is, a drop in the production cost (value) of that product.

The basic advantage of this index--stressed by experts of the International Labor Office--is that with its aid it is possible to total the labor incorporated in various stages of the production process. Using absolute data concerning labor productivity--calculated, for example, in meters or kilograms of the product produced by one worker per hour or day--they cannot be added to the result attained in other stages of production. However, with the use of the index of labor absorption it is possible to add or subtract the individual results. This facilitates, for example, a comparison of the productive results of two factories producing cotton textiles, one of which is equipped with a spinning mill and a loom and the other with only a loom. Using the index per unit of product, it is possible to show for the first of these factories separately the quantity of labor absorbed by weaving and compare it with the data of the second factory, which it would be impossible to do using the index of production in meters per worker.

The already mentioned International Conference of Labor Statisticians recommended in its resolution that "in analyses and comparisons concerning individual processes or a specific industry, priority should be given to data expres-

sed in the form of man-hours per unit of production because of the advantage presented by the possibility of adding up man-hours per unit of production in combinations or analyses of individual stages of the production process existing in various countries."<sup>4</sup>

But this problem can and should be viewed also from a different point: the proper preparation and skillful utilization of the index of labor absorption is of great practical importance in a planned socialist economy. Increasing attention is now being concentrated on this problem in the Soviet Union.

One of the Soviet authors, discussing the role of both the above presented indices of labor productivity (p:t and t:p) writes the following: "The first of these indices found application in practical work of industry, it is officially planned and taken into account; the second is used much less than the index of production. The targets concerning the labor absorption of production and lowering it are not encompassed by the indices in force in planning; in several branches of production there are no labor absorption records. What is more, certain authors either take no notice of labor absorption or do not include it among the indices of labor productivity."<sup>5</sup>

Although the index of labor absorption, as it is stressed by the same author, became rather widely accepted in the practice of individual enterprises, "sovnarchoses," and branches of industry; particularly for current and long-term planning and for an analysis and control of fulfillment of planned targets, the application of this index is insufficient. In conclusion, the author writes: "Wide utilization of indices of labor absorption for increasing the productivity of labor and for technical and economic planning is possible and necessary both theoretically and practically. The application of two indices will improve the methods of measuring labor productivity."<sup>6</sup>

Thus, the index of labor absorption becomes of great importance in a planned socialist economy, and for this reason it should become a subject of particular attention for our statisticians and economists.

For international comparisons, the Conference of Labor Statisticians recommended the use of productivity indices based on the volume of production per worker or per man-

hour (avoiding value indices because of the difficulty of using the proper exchange rate of currencies).

Recently, a special index has been applied in the Soviet Union for international comparisons, constituting a combination of the basic economic index of production (production per inhabitant) and the index of labor productivity (volume of production per employee working on material production). This index is calculated by multiplying the labor productivity by a fraction expressing the proportion of productive workers to the population.

Any treatment of labor productivity requires a strict determination of both parts of the investigated ratio: product produced (p) and quantity of labor in the given unit of time (t). The proper determination of (p) requires not only the determination of the volume of production in units of measurement or weight but taking into account quality and other properties characterizing the given product. For example, to determine the labor absorption of the production of a machine tool, automobile, or television set and compare it with the production in another factory at home or abroad, we must know exactly the technical characteristics the degree of precision of finishing and of technical control, etc., in both cases compared. Similarly, if we compare progress of productivity in the same plant or in the same branch of industry over several years or a decade or more, a ton of coal extracted in a given mine will qualitatively remain the same product in 1959 as it was in 1949, but radio sets produced over an interval of 10 years may be something basically different and incomparable.

Particular difficulties are represented by the second component of the analyzed ratio--labor in a definite unit of time (t). The problem posed by theory and never so far solved in practice is taking into account, apart from live labor, also past labor incorporated into the materials, machines, installations, and tools used in the production process. Thus, it is first of all necessary to take into account in the comparisons (in time or in space) the influence of the degree of mechanization of production on labor productivity. In the already mentioned publication of the International Labor Bureau, the possibility of taking this factor into account in measuring labor productivity is rejected because of the absence of proper material and statistical data and the great difficulties which their collection would present. Recognizing this practical argument, it

is still impossible not to stress, as Prof Strumilin did in the already quoted work, that particularly in the Marxist economic analysis this constitutes a serious shortcoming. The author recalls that the value of each product is determined by all the labor incorporated into it, past ( $t_1$ ) and live ( $t_2$ ). Strumilin also quotes the following statement of K. Marx: "Increase in the productivity of labor consists in the fact that there is a decrease in the share of live labor and an increase in the share of past labor, but in such a way that the total of labor incorporated into a product falls."<sup>7</sup>

With this Marx adds: "In a community in which the producers regulate production according to a plan prepared in advance, and even in simple commercial production, productivity of labor would certainly be measured according to this scale."

However, Prof Strumilin stresses that "despite the fact that the national economy of the USSR is already decades old, Soviet statistics measure labor productivity in that economy not on this scale, not according to Marx, but still according to the old formulas of our practice, in which the magnitude  $p:(t_1 + t_2)$  is replaced by a magnitude  $p:t_2$ , absolutely not equal to it, taking into account in the denominator of this fraction only live labor in each individual enterprise....Only from a simple comparison of the above formulas it follows obviously that using the old measure of productivity per worker we greatly exaggerate the attained level of labor productivity because  $p:t_2$  is always larger than  $p:(t_1 + t_2)$ ." In consequence, fully appreciating the difficulties of taking into account, in measuring labor productivity, the factor of past labor (together with live labor), Strumilin demands that the necessary effort be made to overcome these difficulties.

The comparability of the labor factor in the given country in time or between individual countries gives rise to several other problems. One of them is the question to what extent, if at all, it is necessary to include in the number of employed persons (denominator of the  $p:t$  fraction) those who are totally and partly unemployed. It is clear that exclusion of this factor (as is done in American statistics) narrows down the size of the labor force and therefore artificially increases the index of labor productivity.



In the present article I wanted only to point to certain essential problems connected with measuring labor productivity, their importance, and the necessity to concentrate attention on starting serious work on the development of the currently conducted studies and improvement of the indices used in Poland. I am of the opinion that, apart from regular, periodic statistics in this field, it would also be necessary to start studies of labor productivity by the representative method (as was, for example, done in Soviet kolknoses in 1937). A recommendation of this kind is also contained in the already mentioned Resolution of the Seventh International Conference of Labor Statisticians. During that conference the representative of the UN European Economic Commission stated that, in the absence of better methods of measuring labor productivity, the European Commission was forced to use the very crude method of dividing the index of production by the index of employment, although everybody realizes that the results obtained in this way contain "a large number of errors and provide a very crude measure of changes in productivity." This statement was sharply criticized by the representative of Norway, who opposed sacrificing exactness of comparisons to the needs of the moment.

It is evident from the critical opinions quoted here that the state of labor productivity statistics throughout the world is far from perfect. But this should not relieve us of the duty of making a great effort to effect a rapid and complete improvement of our own labor productivity statistics, which should become the foundation for the drive to increase labor productivity, launched in Poland.

#### Footnotes

<sup>1</sup>S.G. Strumilin, Problemy wydajnosci pracy [Labor Productivity Problems], Ksiazka i Wiedza [Book and Knowledge Publishing Enterprise], 1949, p 33.

<sup>2</sup>Prof Stefan Szulc was the Polish representative.

<sup>3</sup>International Labor Bureau, Methods of Establishing Labor Productivity Statistics, Geneva 1951.

<sup>4</sup>The Seventh International Conference of Labor Statisticians, International Labor Office, Geneva 1952, p 45.

<sup>5</sup>M. Demchenko, "Labor Absorption of Production, an Important Index of Labor Productivity," Sotsialisticheskiiy Trud, No2, 1959, p 2.

<sup>6</sup>Ibid, p 23

<sup>7</sup>K. Marx, Capital, Vol III, Part I, p 280.



POLAND

Directive on the Classification of the  
National Economy<sup>1</sup>

[This is a translation of an article by Zygmunt  
Peuker in Wiadomosci Statystyczne, Vol IV, No 4,  
July/August 1959, Warsaw, pages 28-29; CSO: 3637-  
N/e]

Directive No 32 of the President of the Main Statistical Bureau (Blowny Urzadz Statystyczny) of 14 August 1959 (symbol II/1-27/32-32), issued in cooperation with the Chairman of the Planning Commission (Komisja Planowania) and the Council of Ministers (Rada Ministrow), introduced, as of 1 January 1960, the Classification of the National Economy. The classification has the following outline:

1. Explanations discussing the general principles on which the classification was based.
2. Part A: containing a discussion on the division of the national economy into a sphere of material production and a sphere of activities outside material production.
3. Part B: division of the national economy into sections.
4. Part C: division of the national economy into sections and branches.
5. Detailed classification of the national economy containing a more precise discussion of the scope of the individual groups of the national economy.

The total of the national economy was included in the following 13 sections: industry; construction; agriculture; forestry; transport and communications; commodity turnover; communal and housing management; education, science, and culture; health protection, social services and physical culture; public administration and justice; financial and insurance institutions; political, social, and religious organizations; others.

The sections are divided into 74 branches and these in turn into 236 groups, while 32 branches are not divided into groups.

The classification determined the following principles of division into the sphere of material production and the sphere of production outside material production.

Classified in the sphere of material production is basic activity in the following sections of the national economy: industry, construction, agriculture, forestry, transport and communications, commodity turnover.

Not included in the sphere of material production in this section are "activities connected with the factory"--that is, activities outside of material production (such activities as kindergartens, preparatory schools, hotels, etc.). Also not included in the sphere of material production are activities of plants and units classified in certain branches or groups (of the above-listed sections) listed by name in the classification--for example, in the "construction" section not included in the sphere of material production are the activities of establishments and units in items: 34) geodetic and cartographic enterprises, 35) units of investment supervision, etc.

However, included in the sphere of material production, apart from the above mentioned, are three groups in the section "communal and housing management"--namely, water supply and sewer plants, communal power, and dry cleaners and dyers.

The following sections of the national economy are included in the sphere of activities outside material production: communal and housing management (except for the above-mentioned three groups included in the sphere of material production); education, science, and culture; public administration and justice; financial and insurance institutions; political, social, and religious organizations; others.

In addition, included in the sphere of activities outside material production--in accordance with the principles given above--are parts of activities classified in the sections of material production.

The classification also introduced the division of the "industry" section into extracting and processing industries,

denoting groups constituting the extracting industry. Artisan workshops are classified in the proper industrial groups.

The four-step division of the national economy (spheres, sections, branches of industry, groups) finds its reflection as follows in the symbols used in the classification: spheres are denoted by figures I and II; sections are denoted by collective symbols of branches (for example, Industry 01-22, Construction 31-36, etc.); branch is denoted by a two-digit symbol; and groups are given a four-digit symbol. Noteworthy is the system of denoting sections by compound symbols of branches (01 is the symbol of the branch "production of electric and thermal power"; 02 is the symbol of the branch: "fuel industry," etc.), thanks to which it was possible to denote a branch by a two-digit symbol and a group by a four-digit symbol. It is important to use the minimum number of digits in a symbol in order to simplify machine studies and decrease the labor outlays for these studies, and in addition it contributes to a considerable decrease in errors resulting in multi-digit symbols, difficult to catch by sight.

In accordance with the decisions of the directive of the President of GUS [Główny Urząd Statystyczny; Main Statistical Bureau] introducing the Classification of the National Economy and quoted in the beginning, the classification is applicable in planning and statistics, and particularly in the preparation of national economic plans and statistical computations concerning the execution of targets resulting from these plans. It will introduce uniformity in dividing the national economy into sections (or branches and groups), both in planning computations and in statistical studies. . . . Heretofore different classifications were used in planning and in statistics, and in statistical computations not a uniform classification was used but different classifications constructed from the point of view of individual sections of statistics. Such a situation caused numerous difficulties, such as in the preparing computations concerning the control of the execution of plan or in preparing statistical computations containing data for multi-year periods, during which various classifications were used.

The introduction of the Classification of the National Economy will remove (though not immediately) several difficulties and will therefore contribute to uniformity and facilitate close coordination of planning work with statistical work, making it possible to obtain comparable data

without having to make time-consuming and difficult regroupings, etc. The Classification of the National Economy, as the first classification of this kind to encompass in a systematic outline the total of the national economy, is of serious importance as a contribution to theoretical and practical undertakings concerning one of the basic problems of social and economic statistics--the problem of correct classification of the national economy.

Undoubtedly, the introduced classification is not an ideal one (besides, work on classifications of this kind is and has to be continuous work because of the rapid development of the national economy and the emergence of new fields of industry, technology, and science). Many accepted solutions are of symbolic nature (this applies particularly to such sections as construction, communal and housing management, public administration and justice); many definitions may give rise to doubts--which, as a matter of fact, are entertained by the team preparing the classification--but nevertheless the preparation and introduction of the classification constitutes a clear step forward in the direction of filling the methodological and organizational and practical gap which the absence of this kind of classification had heretofore constituted.

It is worth stressing that the comparatively long period of preparation of the classification (about one and a half years) results, among other things, from the limited popularity of the discussed problem among statisticians, planners, and economists.<sup>2</sup>

#### Footnotes

<sup>1</sup>See article by Z. Peuker: "The Draft of Classification of the National Economy," Wiadomosci Statystyczne, No 6, 1958.

<sup>2</sup>Possible remarks concerning the classification should be addressed to: Main Statistical Bureau, Department of Coordination of Statistical Work and of Information (Departament Koordynacji Prac Statystycznych i Informacji), Warsaw Ulica Wawelska 1/3.

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